THE UNIVERSITY
OF ILLINOIS
LIBRARY

616.805
JO
v.63

PSYCHOLOGY

Return this book on or before the
Latest Date stamped below.

University of Illinois Library

DEC 1 1958

L161—H41

LIBRARY
UNIVERSITY OF ILLINOIS
URBANA

VOL. 63 JANUARY-JUNE 1926

The Journal
OF
Nervous and Mental Disease
AN AMERICAN JOURNAL OF NEUROPSYCHIATRY

FOUNDED IN 1874

MANAGING EDITOR
DR. SMITH ELY JELLIFFE

WITH COLLABORATION OF

DR. C. L. ALLEN, Los Angeles, Calif.
DR. C. E. ATWOOD, New York, N. Y.
DR. LEWELLYS F. BARKER, Baltimore, Md.
DR. B. BROUWER, Amsterdam, Holland
DR. CARL D. CAMP, Ann Arbor, Mich.
DR. C. MACFIE CAMPBELL, Boston, Mass.
DR. LOUIS CASAMAJOR, New York, N. Y.
DR. L. PIERCE CLARK, New York, N. Y.
DR. HARVEY CUSHING, Boston, Mass.
DR. FREDERIC J. FARNELL, Providence, R.I.
DR. BERNARD GLUECK, New York, N. Y.
DR. MENAS S. GREGORY, New York, N. Y.
DR. C. JUDSON HERRICK, Chicago, Ill.
DR. GORDON HOLMES, London, Eng.
DR. J. RAMSAY HUNT, New York, N. Y.
DR. C. ARIËNS KAPPERS, Amsterdam, Holland
DR. EDW. J. KEMPF, New York, N. Y.
DR. GEO. H. KIRBY, New York, N. Y.
DR. ADOLF MEYER, Baltimore, Md.
DR. L. J. J. MUSKENS, Amsterdam, Holland
DR. GEO. H. PARKER, Cambridge, Mass.
DR. E. A. SHARP, Buffalo, N. Y.
DR. GREGORY STRAGNELL, New York, N. Y.
DR. OLIVER S. STRONG, New York, N. Y.
DR. E. W. TAYLOR, Boston, Mass.
DR. WALTER TIMME, New York, N. Y.
DR. FRED W. TILNEY, New York, N. Y.
DR. WM. A. WHITE, Washington, D. C.
DR. S. A. K. WILSON, London, England

NEW YORK
64 WEST 56TH STREET
1926

INCORPORATED
BOYD
PRINTING
CO

616.805
JO
v. 63

ORIGINAL CONTRIBUTIONS

PAGE

On Atypical and Masked Forms of Encephalitis Epidemica (Lethargica) on a Basis of About 125 Cases. By Axel V. Neel 1

Behavioristic Attitudes Caused by Speech Disorders. By May Kirk Scripture, B.A., and John A. Glassburg, M.D 17

Spinal Cord Tumors. Report of Six Cases Including Tuberculoma of Dura. By Max H. Weinberg, M.D 23

Unilateral Argyll-Robertson Pupil, with Presence of Consensual Reaction in Both Eyes. Report of a Case. By William C. Menninger, M.D. 58

The Pupils in Somatic and Visceral Disorders in Association with Referred Pain and Hyperalgesia. By Joseph Byrne, A.M., M.D., LL.D. 105

Dementia Precox in Identical Twins. By G. H. Parker, Ph.D. 135

Four Unusual Cases of Spinal Cord Compression. By Simon Rothenberg, M.D. 143

The Problems Presented by General Paresis. By Professor Dr. Emil Kraepelin 209

Vegetative Disturbances in Post-Encephalitic Syndromes and Their Relationship to Diencephalic and Mesencephalic Lesions. Changes in Basal Metabolism. By Sante Naccarati, M.D., Ph.D., Sc.D. 219

A Study of the Psychogenesis of Confirmed Stammerers. By L. Pierce Clark, M.D. 238

The Character of Modern Psychiatry: A Synthetic Presentation of the Work of Paul Schilder. By Sam Parker, Stud. Med. 313

Diffuse Glioma (Gliosis). Report of Two Cases. By Frederick P. Moersch, M.D. 343

Facial Diplegia in Neoarsphenamin Polyneuritis. By George B. Hassin, M.D., and Chas. F. Read, M.D. 352

Postencephalitic Respiratory Disorders. Review of the Syndromy, Case Reports and Discussion. By Smith Ely Jelliffe, M.D., Ph.D. 357, 467, 592

612805

PAGE

The Ancient Idea of Consciousness and the Human Mind. By Jonathan Wright, M.D. 433

A Comparative Study of Various Methods of the Administration of Luminal in Epilepsy. By Harold A. Patterson. M.D., F.A.C.P., Le Grand A. Damon, M.D., and Paul Levi, M.D. 446

Vagotonia and Hypoglycemic Reactions. Seventeen Cases. By Johannes M. Nielsen, M.D. 456

Bergson's Conceptions as Applied to Psychopathology. By Dr. E. Minkowski. Authorized Translation by Frederic J. Farnell, M.D., F.A.C.P. 553

Tryparsamide in the Treatment of Late Neurosyphilis. By J. Ross Moore, M.D., and Irwin C. Sutton, M.D. 569

A Further Contribution to the Psychology of the Essential Epileptic. By L. Pierce Clark, M.D. 575

On the Classification of the Psychoses. By Leland B. Alford, M.D. 586

Society Proceedings:

Boston Society of Psychiatry and Neurology 61, 253

New York Neurological Society 149, 246, 372, 478, 612

Current Literature:

Vegetative Neurology 68, 164, 265, 497, 622

Sensori-Motor Neurology 78, 173, 276, 392, 510, 630

Symbolic Neurology 87, 185, 288, 409, 526, 636

Social Neurology, Religious Psychology, Medico-Legal, etc. 416

Book Reviews 94, 195, 301, 425, 540, 645

Obituaries:

Albert Mahaim 96

Richard Cassirer 97

John Newport Langley 98

José Ingenieros 206

John Henry Wallace Rhein 206

Nathan E. Brill 429

Camillo Golgi 429

Franz Tuczek 431

Henry Rust Stedman 546

Henry Rayner 549

Albert Polon 550

Notes and News 102, 650

Vol. 63 JANUARY, 1926 No. 1

The Journal

OF

Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

Original Articles

ON ATYPICAL AND MASKED FORMS OF ENCEPHALITIS EPIDEMICA (LETHARGICA) ON A BASIS OF ABOUT 125 CASES *

By Axel V. Neel

COMMUNICATION FROM THE SIXTH DEPARTMENT OF THE MUNICIPAL HOSPITAL OF COPENHAGEN AND FROM THE PSYCHIATRIC LABORATORY

(Chief: Prof. Dr. A. Wimmer)

The object of this research is an attempt to demonstrate, by means of the increased occurrence of certain changes in the spinal fluid that, in addition to the typical and generally recognized cases of encephalitis epidemica, there also occur a great many indistinct and atypical cases which, as a rule, are not diagnosed as encephalitis, but are considered as affections of some other kind.

In order to explain the heading of this communication, let us at once give a survey of the diagnoses according to which these patients have been treated and of whom we hope to be able to prove or, at least, to make it appear likely that they have had, or have, encephalitis.

Table I

Survey Over the Diagnoses

Alcoholism	10	Climacterium	1
Cephalea	2	Hemorrhagia cerebri	3
D. paralytica	1	Meningitis tub.	1
Encephalitis acuta	7	Myelitis disseminata	1
Encephalopathia lucia	14	Neuritis cranii	2
Dementia senilis	1	Tumor pontis	3

* Lecture held at the First Scandinavian Congress of Neurologists, August, 1922, and in the Medical Society of Copenhagen, October, 1922. (Somewhat enlarged.)

Hemiplegia	10	Paralysis bulbaris	1
Hysteria	4	Polyneuritis	3
Arthritis humeri	1	Neurasthenia	2
Observatio.	1	Mb. mentalis	2
Arteriosclerosis cerebri	16	Epilepsia	5
Confusio mentis	16	Sclerosis disseminata	3
Cerebralia acuta	1	Tumor cerebri	3
Encephalomalacia	12	Hypochondria	1

Let us now briefly indicate the methods we adopted.

After having examined for about seven years the spinal fluids from the Sixth Department,† it struck me in the course of the year 1921, that certain changes of the spinal fluid occurred much more frequently than before, and, by means of different and varying tests, the reality of the changes was established. A preliminary investigation was then made of the symptoms appearing in those patients who showed the above named changes. These symptoms were suggestive of encephalitis.

These changes in the spinal fluid which commenced to occur with unwonted frequency consisted of a very slight increase of albumin in the spinal fluid with, or without, a very small increase of cells. Such findings are in themselves by no means rare, but on the other hand, there must be a special reason for their sudden and more frequent occurrence under circumstances which, in all other respects, are similar.

The following list will help to convey an idea of the affections and the conditions in which such changes of the spinal fluid can occur.

TABLE II.

Survey Over the Causes of the Changes in the Spinal Fluid of the Type Occurring in Encephalitis Epidemica.

Tumores cerebri—"Hirnschwellung," polyneuritis infectiosa, neuritis ischiadica, neuritis caudæ equinæ, meningism, meningitis serosa traum, hematomyelia, herpes zoster, hemorrhagia meningealis sequel, confusio mentis senilis, apoplexia cerebri recidivans, emollitio cerebri progressiva, lues cerebri inicipiens, lues cerebri vetus, lues cerebri post curam, sclerosis dissem, epilepsia post ictum, "Zuchthausknall," strangulatio.

From this list, which is only a survey without pretence of being complete, it becomes evident that, as a result of the experience we

† This is the department in which these and other mental cases are examined and treated.

have gained in the course of the last few years by means of the method employed, the changes in the spinal fluid may be attributed to a good many causes. It is not possible, however, here to discuss all the various states and affections, their common feature, however, being that none seems to justify the sudden frequency of the changes and, thus help to explain their increase in number. We only have to point (are content with pointing) out that, within the diagnosis of "Hirnschwellung," meningitis serosa, apoplexia recidivans, confusio mentis senilis, emollitio cerebri progressiva, cases of encephalitis might very well be concealed.

In order to obtain a more exact idea of the changes which take place, as well as to determine whether their frequency has actually increased, the following experiment was made.

All the spinal fluid examinations made during the six years from 1916 to 1921 were subjected to reëxamination and, subsequently, all those cases where the patient had suffered from one of the complaints of a typical nature mentioned in the above named list, were eliminated. It must be borne in mind that all the spinal fluid examinations were originally made without any previous knowledge of what the patient in question suffered from; moreover, the patients have only been traced months or years after the spinal fluid had orginally been examined.

The remaining cases were subsequently examined in order to ascertain those causes of the disease which had not hitherto been recognized. These remaining cases were found to be distributed in the following manner:

In 1916—	6	cases	were	found	
" 1917—	2	"	"	"	
" 1918—	3	"	"	"	
" 1919—	19	"	"	"	
" 1920—	21	"	"	"	
" 1921—	40	"	"	"	
" 1922—	36	"	"	"	(until May)

It appears from this compilation that, in 1921, there was a considerable increase, an increase which commenced in 1919, curiously enough at the same time as encephalitis lethargica first appeared in Denmark. This coincidence of appearance might therefore justify the assumption that encephalitis epidemica was the cause of the more frequent occurrence of the changes in the spinal fluid, but this supposition is contradicted by the fact that, already in 1916, to which year the investigations go back, there were found six cases, that is

to say, about a year prior to the epidemics in France, Vienna and England.

Before we could proceed further in our investigation, it was necessary to discover what cases occurred *before* 1919, and these proved to be as follows:

Case 1. 1916. Male, aged forty-three. Acute onset, fever, lethargy; eye symptoms, bulbar symptoms. Spinal fluid: cells 2/3, globulin 1, albumin 15; hiccoughing; clinical diagnosis: encephalitis. August, 1922: After a long convalescence, the patient, a watchman, was partly able to work. He had to give up his previous occupation (as motor driver), because he was not in possession of the necessary circumspection and quickness in his movements. (He has become very obese after his illness, is sluggish and apathic, liable to fly into a passion, and irritable when contradicted, quite the reverse of his former character.) The reaction of the pupils to light is strikingly feeble, but apart from these symptoms there is nothing particularly abnormal except his premature obesity and his inability to perform quick movements.

Case 2. 1916. Woman, aged twenty-eight. Acute onset, lethargy, eye symptoms; spinal fluid: cells 2/3, globulin 1, albumin 10, nystagmus. Clinical diagnosis: degen. psychopath. Abus spirituosor. (According to the journal the patient denies whatsoever use of medicamina and abuse of alcohol.) She has not yet been traced (1922).

Case 3. 1916. Male, aged nineteen. Acute onset, fever, lethargy, eye symptoms, bulbar symptoms; spinal fluid: cells 50/3, globulin 1, albumin 10. Clinical diagnosis: tumor cerebri. Post mortem examination not allowed.

Case 4. 1916. Female, aged nineteen. Acute onset, fever, lethargy, eye symptoms, bulbar symptoms; spinal fluid: cells 2/3, globulin 1, albumin 7. Clinical diagnosis: neuritis n. cranii V, VII and VIII.

Case 5. 1916. Male, aged forty-four. Acute onset, eye symptoms, bulbar symptoms; spinal fluid: cells 15/3, globulin 1, albumin 15. Clinical diagnosis: dem. alcohol. Deliria alcohol.

Case 6. 1916. Woman, aged thirty-three. Acute onset, eye symptoms, bulbar symptoms; spinal fluid: cells 7/3, globulin 0, albumin 8.

Case 7. 1917. Woman, aged fifty-two. Spinal fluid: cells 2/3, globulin 1.5, albumin 25. Extrapyramidal symptoms. Information as to the onset of the disease incomplete. Clin. diagnosis: dementia organica, tumor cerebri, sclerosis dissem. cerebri.

Case 8. 1917. Girl, aged sixteen. Acute onset, fever, lethargy, eye symptoms, bulbar symptoms, changes of spinal fluid. Clinical diagnosis: tumor cerebri. In the summer 1922: nystagmus, bilateral Babinski; periodically, double vision. Her state has remained unchanged during the last three years. Cured although with certain defects.

Case 9. 1918. Male, aged forty-five. Acute onset, fever, lethargy, eye symptoms; spinal fluid: not examined. Clinical diagnosis: encephalopathia. Tumor?—October, 1922. After a long convalescence, where he suffered very

much from sleepiness, he gradually became able to work, and he has now been working at road making and sewage work on normal wages.

Case 10. 1918. Woman, aged sixty-nine. Acute onset, eye symptoms, bulbar symptoms; spinal fluid: cells 2/3, globulin 0, albumin 15. Stiffness resembling paralysis agitans. Clinical diagnosis: spastic paralysis, arteriosclerosis cerebri.

The first case shows all the classic symptoms which encephalitis epidemica presents, such as lethargy, paresis of the eye muscles, hiccoughing and, probably, accommodation paresis; it was therefore diagnosed as encephalitis. In the other cases, moreover, so many characteristic symptoms are found—the Parkinsonian type and other extrapyramidal motor disturbances are, for instance, also represented —that it appears somewhat ridiculous not to accept those cases which occurred before 1919, as being due to encephalitis epidemica.

The occurrence of these individual cases before 1919 is no argument against the frequent occurrence of changes in the spinal fluid found later on being due to encephalitis epidemica, for the examination of each of these early cases has revealed symptoms which completely resemble those of cases of encephalitis epidemica, so much so that, from a clinical point of view they cannot be distinguished from them.

The first result of the examination, then, tends to confirm the assumption that encephalitis epidemica occurred in Copenhagen during the years immediately preceding the announcement of the epidemics in Australia, France, Vienna and England.

The nature of the changes in the spinal fluid and the frequency with which the various types of changes occur, will best appear from a survey. Unfortunately, we have not, as is the case with syphilitic affections, any specific reaction to guide us, and the changes we find are not in themselves specific or different from changes which may also occur in other diseases. It is possible that more positive results may be obtained later on, for instance with the help of intracerebral inoculation of the fluid on rabbits, but as yet, the results of the researches on encephalitis epidemica and its inoculation on rabbits arrived at by the different investigators are so contradictory that that method does not seem to be practicable, especially in cases where the spinal fluid presumably is not very virulent. An examination of the spinal fluid alone, therefore, does not give us the diagnosis, which in fact can only be arrived at in close relation with the general examination; and then, in many cases it will be a diagnosis per exclusionem. It must, however, be borne in mind that the examination of the spinal fluid may be, and in many cases has been, the first

step towards a correct diagnosis, the changes having revealed that, in the particular case concerned which had hitherto given the impression of being a purely functional trouble, was in reality something quite different.

TABLE III

The Nature and Distribution of the Changes in the Spinal Fluid [1]

Number of Cases	Cells	Globulin	Albumin (Total)
9	0/3–5/3	0	10
33	0/3–20/3	0	15
19	0/3–20/3	1	10
30	0/3–20/3	1	15–30
6	20/3–290/3	0	10
30	20/3–500/3	0–3	15–50

The cells which consist of lymphocytes and larger mononuclear cells (in a few cases where the post-mortem examination shows an encephalitis of the encephalitis lethargica type, polynuclear leucocytes are apparently also encountered), have been counted in a Fuchs-Rosenthal's counting chamber, to which the numbers refer.

The result of the determinations of albumin is generally given in accordance with Bisgaard's method, Pandy's method, however, being employed at the same time; while the globulin has been determined ad modum *Guillain-Schum, Nonne-Apelt.* This will be the subject of further consideration in a treatise which will be published in the near future.

The above statistics show that pathological changes have been found in almost all the cases, though strictly speaking, there were only 2 cases in which the spinal fluid was perfectly normal. This result may seem to contradict decidedly numerous statements in the literature of encephalitis, where it is constantly emphasized that the spinal fluid very often does not show anything abnormal. These statements, however, depend entirely upon the method employed for the examination of the spinal fluid.

Very often, especially in Germanic and kindred countries, only a determination of albumin ad mod. Nonne-Apelt, that is to say, a globulin determination, is made. A glance at the survey, then, will show that in no less than 42 cases—the first 2 groups—the content of albumin is normal.

[1] Cf. *Wimmer.* Psychiatric neurological examination methods. St. Louis, 1919, pp. 168–70. (The figures stated as normal in this work are too high and should be corrected.)

There are many authors who, on Nonne's authority, consider a content of 15/3 cells as being perfectly normal, and a content of up to 30/3 cells as not yet decidedly pathological, so that there are many cases which, in regard to cells lie within the limits which are considered normal, or not certainly pathological by a great many authors.

Finally, if the cells are judged according to Nonne's method and the albumin figures according to Bisgaard's original indications, *i.e.*, that the normal limits of globulin be 2 and those of albumin 20, it becomes evident that more than one-half of the cases show normal conditions, in other words, that the first 3 groups altogether and a few cases from the last 3 groups, too, are within the normal limits.

Together with several other physicians, I venture to restrict the limits in which the last 5 groups show absolute pathological spinal fluid, and refer to a recently published essay on the subject.[2] We hope to prove thereby that the normal spinal fluid does not contain more than 1/3 cells, 0 globulin, nor above 10 albumin.

Even though the spinal fluid, as a rule, shows more or less pronounced pathological changes, there have been cases of acute, typical encephalitis epidemica resulting in death, where the spinal fluid, at the first examination appears to be perfectly normal in regard to its tenor of cells and albumin. Such a case occurred in the Sixth Department, where the patient died on the following day. At the microscopic examination very extensive inflammatory changes of typical appearance and localization were observed, an incidence which teaches us to be careful with respect to the conclusions we derive from the tenor or nontenor of cells and albumin of the spinal fluid as to intracerebral inflammatory changes.

In regard to the changes in the spinal fluid it is necessary to emphasize that they coincide with the changes, first in the acute cases of encephalitis epidemica, and afterwards in the definite cases of chronic forms of encephalitis epidemica. With respect to the differential diagnosis as opposed to cases of influenza with symptoms from the central nervous system we can verify that from 5 to 6 consecutive punctures have been made of very typical and pronounced cases, but that changes of the spinal fluid were not found in any of them.

Considering the changes of the spinal fluid on the whole, we assume that there will be general agreement that they must be due to an inflammation of one kind or another. Thus, we do not think that anyone will for instance deny that the changes, according to their character, might not just as well be due to syphilis.

[2] Neel. Über den Zellen und Eiweissgehalt der normalen Spinalflüssigkeit. Schweizer Archiv f. Neurologie u. Psychiatrie. Bd. XV, 1924, S. 70–96.

We have now come as far as demonstrating that, simultaneously with the epidemic occurrence of encephalitis lethargica, there is a definite increase of cases evidencing symptoms in the nervous system, where the spinal fluid shows changes which completely resemble those experienced in chronic inflammations. We think therefore, that it will be generally admitted that this coincidence tends to support the assumption of encephalitis epidemica being the causative agent of those changes.

Before proceeding any further, it must be emphasized that the existence of a great many slight, abortive cases should be anticipated, for otherwise it would not be understandable how the different, scattered, fully developed and therefore, notified cases had originated. In this respect also, there is a resemblance between encephalitis epidemica and acute poliomyelitis anterior, and the investigations made in Sweden (Wilhelmina) have, moreover, directly proved the existence of a great number of such masked abortive cases.

A further point in support of the assumption of encephalitis epidemica being the cause of the changes would be obtained, if one could succeed in showing that certain symptoms which empirically often occur in encephalitis epidemica, are also frequently found in (this material), or if it could be proved that those regions where the encephalitis epidemica particularly localizes itself, are also clinically affected.

It is well known that encephalitis epidemica localizes itself particularly in the cerebral trunk—the great basal ganglia, the region about the aquaeductus Silvii, pons, medulla oblongata and the cerebellum—and, therefore, it would be of great importance to find especially those symptoms which are due to disturbances in these regions. In the first place, there are the affections of the great ganglia of the brain, the corpus striatum, etc., which particularly, cause the " extrapyramidal " motility disturbances. These affections, however, are not included in this treatise; they have already been discussed by Professor *Wimmer*.[3] We mention them in order to point out that, just as we encountered a great many cases of extrapyramidal motility disturbances following upon encephalitis epidemica, we must also expect to get a great many cases due to disturbances in the other preëminently affected regions. From a diagnostic point of view, however, there is this great difference, namely that the extrapyramidal cases represent something new, something which is not usually caused by those affections we are

[3] Chronic epidemic encephalitis. London. 1924.

accustomed to take into account, such as syphilis, disseminated sclerosis and arteriosclerosis, while, in regard to the other regions, cases are constantly found which are due to one of the above mentioned affections.

As a consequence, we do not hesitate to associate a Parkinsonism (paralysis agitans) developing in a young individual with an encephalitis epidemica infection, even though we are not able to determine the moment when the infection took place, while, for instance in a case of bulbar affection, we are inclined to place particular emphasis upon the well known etiological factors, that is to say disseminated sclerosis and syphilis. If, however, during a definite period, these cases of bulbar affections increase considerably in number, we are of opinion that that in itself is a sufficient reason for a very careful examination as to whether this increase might be due to the new etiological factor, *i.e.,* encephalitis epidemica, for there is no reason whatever to suppose that syphilis, disseminated sclerosis, or arteriosclerosis, should suddenly display such a predilection for bulbus that that could account for the increase of cases with bulbarly localized affections.

TABLE IV

Survey Over the Symptoms

Acute onset of the disease—114 cases, insidious—13 cases, fever—(NB) 42 cases.

Lethargy—48 cases, insomnia—8, eye symptoms—84 cases.

Bulbar disturbances of speech—31, bilateral Babinski—26 cases.

Hemiplegia without general brain symptoms—26, cerebellar disturbances—27 cases.

Acute, psychic disturbances—34, chronic psychic disturbances—20, change of character—11, neuralgiform pains—12 cases.

Myoclonic jerks—13, formication in the hands—8 cases.

Hiccoughing—3, optic neuritis—3 cases.

Spinal fluid normal in 2 cases (cells 2/3), pathological in 125 cases.

The above represents a compilation of the symptoms which most frequently occur, as registered in the journals of the department and which have been reported entirely without our assistance and with no special regard to encephalitis epidemica. It is, therefore, permissible to assert that, in data where no particular search is made for signs of affections of the brain trunk, if one encounters so many symptoms of it, this tends to prove a connection between the different cases, for it must be borne in mind that these

cases beforehand possess a certain resemblance to each other, namely, the identical findings in the spinal fluid and their simultaneous occurrence.

It is not feasible here to enter into a detailed discussion of the different symptoms, but we must utter a note of caution against conceiving an acute onset of the disease as sufficient to identify all these cases with acute encephalitis. The acute onset may also be caused by a sudden emollition which, in itself, may often be traced back to a chronic vascular affection. The denomination has more importance, inasmuch as it indicates that the symptoms occur at a moment of apparent perfect health, and that, therefore, in case the disease be due to a simple arteriosclerosis, the spinal fluid would be expected to be normal, while the changes found in it indicate that these symptoms are due to causes other than a simple vascular affection.

In lethargy, only such cases have been taken into account where it is evident from the journal that there is a real state of apathy, where it was still possible to fix the patient's attention on single questions, but where, when left to him- or herself, the patient would relapse into a somnolent, half-awake state. Comatose conditions and agonal changes of consciousness have, of course, not been taken into account, nor any cases where, according to the journal, a medicamental influence could be surmised.

We do not think it necessary here to discuss the other groups of symptoms. We hope occasionally to make these different groups the subject of further consideration. Formication in the hands and arms is a symptom which has been mentioned several times; thus, it figures in the report of the Swedish commission on the Wilhelmina investigations. This symptom must be considered as being due to an affection of the central sensibility spheres. A closer investigation of this point must also be postponed.

In addition to the symptoms mentioned, there may be reason to state that, in a good many cases, phlebitis has been present, in several cases albuminuria has been mentioned and, in a few cases hematuria, symptoms which must be considered as being due to an infection. In four to five cases, the symptoms appeared in connection with pregnancy, in others together with a somatic trauma or some

N.B.—When fever is mentioned, it means that there has been fever in so many cases during the stay in the hospital and without the examination revealing any other plausible causes of the febrile state besides the disease which had shown symptoms from the central nervous system.

other infection, a coincidence which is not unusual in the typical, well pronounced cases of encephalitis epidemica. In no small number of cases, an insult is mentioned which, at least apparently, had been the provocative cause of the disease, and in a striking number of cases it is stated that the patient has a nervous disposition. It is not easy immediately to determine how great or how small a relation there is between these things; it must, however, be mentioned that *Netter,* who has had a good deal of experience in encephalitic cases, makes exactly the same statements, based upon his numerous typical cases in Paris. A coincidence with alcoholism is also frequently met with.

Without going into details in regard to individual cases it would be impossible to convey an exact idea of the differential diagnosis between encephalitis epidemica and any one of the affections mentioned in Table I. However, as such a detailed description would require too much space, we will attempt by other means to indicate and, if possible, to prove that the complexity of symptoms in question is really due to encephalitis epidemica.

We will try to do so by demonstrating that in those cases which have been subjected to a post-mortem examination, and where we have had an opportunity of examining the brain, signs of inflammation were actually found. An ulterior development of the picture of a disease which, empirically, may be associated with encephalitis epidemica, will also be considered as a proof; and, finally, the readmittance of a patient to the hospital where he is diagnosed as suffering from encephalitis, should likewise tend to support this hypothesis.

In reëxamining the data at hand, valuable information as to the diagnosis will be obtained, the subsequent course of the disease being apt either to make the diagnosis arrived at a false one, or to confirm it as an encephalitic affection. The concordance between the symptomatology and the course of the disease in the different groups of cases will also serve to unite the individual cases in a common etiology.

We have so far succeeded, in about 70 out of 127 cases, in proving by different methods that encephalitis has been present. A demonstration, however, of the cases which have been observed from a clinical point of view, would require too much space; we will, therefore, confine ourselves to mentioning the findings in those cases only, in which we have been able to subject the brain to a minute microscopic examination. In none of these cases could any signs of syphilis be traced, neither as a result of information supplied from the

patients themselves, nor from the post-mortem examination; the Wassermann tests of both blood and spinal fluid also proved negative.

In regard to the microscopic findings, these have in many cases been quite similar to those of the typical cases of encephalitis epidemica. In a good many other cases of mostly elderly, though also of some younger individuals, which will be mentioned later on, the results are somewhat different, for in some cases are found—besides typical changes—others chiefly consisting of signs of chronic or sub-chronic vascular alterations accompanied by inflammatory changes. In elderly persons one must, of course, be prepared to meet with a certain amount of senile changes in the vessels of the brain; therefore, in order to avoid that the changes we have found might possibly be confounded with senile decay itself, we have systematically examined corresponding portions of other brains from elderly individuals without, however, finding the above mentioned changes.

Furthermore, we have demonstrated our microscopic preparations before three of our most prominent pathological anatomists, who agreed with us: (1) that these preparations showed signs of inflammations; (2) that the alterations were similar in the different cases, and, in addition, (3) that they were different from the changes associated with syphilitic vascular affections. Finally, microphotographs have been shown, both at the Scandinavian Congress of Neurologists, where *Dr. Kling* privately declared that he had observed somewhat similar pictures in his rabbits, and at the meeting of the Medical Society of Copenhagen, where no criticism was forthcoming.

The reason why we mention these facts is to convey a more complete impression of the nature and importance of the alterations than would be possible by means of a few reports, or by microphotographs for which only the author could be held responsible.

In addition to the usual findings peculiar to acute and subacute encephalitis (see, for instance, *Wimmer:* Chronic Epidemic Encephalitis), there are cases, particularly of elderly persons, where the findings deviate somewhat from the general rule.

At the macroscopic examination of these cases, nothing definitely abnormal has been found in the brain itself in some cases; in other cases, however, extravasations were found which were generally localized in the central parts of the brain or in the pons. Macroscopically, the vessels presented arteriosclerotic changes, in most cases even uncommonly pronounced changes with a thickening of the walls of the vessels, etc., in such a manner that there was the greatest concordance between the clinical diagnosis, *i.e.*, arteriosclerosis cerebri

or emollitiones arteriosclerotícæ and the macroscopical post-mortem findings.

It might, therefore, appear superfluous to discuss this matter further, moreover, as it is well known that, in certain forms of encephalomalacia arteriosclerotica, an increase of the quantity of albumin has been found in the spinal fluid, as has been emphasized by *Bisgaard*. However, these cases were among those where, from reasons mentioned before, we had suspected encephalitis, and which had to be examined in order to make sure whether this was the case or not.

The microscopical examination of these cases revealed concordant changes which consisted of:

1. A more or less pronounced infiltration of round cells around the vessels. In the brains examined, the infiltration is particularly noticeable in the sections from the central ganglia, the cerebral trunk and the cerebellum, where they are found around numerous vessels. In a few cases, there are diffusive changes in the corticalis and meninges of the brain. Infiltration around the individual vessels is rather different, but in the comparatively few specimens so far examined, different vessels have been demonstrated, where this feature is absolutely incontestable, and where it is unexplainable by adventitious causes, howsoever benevolently one might interpret them; this was also acknowledged by the different experts present. In addition to the round cells, pigment cells are found in several places and, in a few sections, small hemorrhages may be seen around the vessels; this phenomenon must be accounted for by the pigment cells, which have given an iron reaction in one particular tested section, this being taken to indicate signs of previous hemorrhages around the vessels. Obliterated, small vessels may also be found represented by accumulations of such pigment cells and round cells localized in greater or smaller numbers in and around the obliterated vessels.

2. Changes of the vessels themselves. These consist of:

a. Hyaline alteration of the wall of the vessel which is then formed by a structureless, thickened ring, while the small vessels present themselves in van Gieson's stain on a longitudinal section as hyaline, almost massive cords.

b. The usually strongly, and often irregularly thickened wall of the vessel has been, as it were, burst or ravelled out in coarse threads resembling loosely coiled-up ropes.

c. The lumen of the vessel, also of the larger ones, can be completely, or nearly, obliterated by the above mentioned changes.

d. In several different brains, such obliterated vessels, as well as vessels with signs of recanalizations were found.

e. The vessel is represented by a fibrous, hyaline mass surrounded by round cells, or without such.

f. The vascular endothelium may sometimes show signs of lively proliferation, so that the vessel is completely, or partly obliterated by the proliferated endothelium cells which are located in a more or less pronounced concentric order.

g. Sometimes, calcareous deposits are met with in and around the vessels.

In all the vascular changes indicated, more or less pronounced round-cell infiltrations are found, as a rule lying in heaps in one place or another near the wall of the vessel. The distribution of the above mentioned vascular changes within the brain corresponds on the whole with the distribution of the round cell infiltrations. In less affected brains, in addition to these altered ones, many vessels which do not show any considerable changes, are to be found; therefore, in my opinion, the presence of very considerably changed vessels together with normal ones in the same section is an indication of one or other local cause of the change, and not of a general cause, such as is presupposed in arteriosclerosis.

3. As a secondary sequel of these vascular changes, we encounter larger or smaller and, particularly, microscopic emollitions in different stages, with fat cells, or in the form of disseminated glioses. The localization of these latter may also suggest their origin, thus, for instance, when they are found around the aquaeductus Silvii.

In some of the brains examined, there are, furthermore, striking changes of the extracerebral, but intracranial vessels, namely, the basilar arteries, the Silvian fossæ, etc.; these are found sometimes to be extraordinarily thickened and, when intersected, show a markedly narrowed or deformed lumen with astonishingly little calcareous substance as compared with the findings in a simple arteriosclerotic change. The smaller vessels are in several cases almost completely obliterated. The exterior appearance of these vessels sometimes reminds one of boiled macaroni, a term which has been employed to characterize certain syphilitic vascular changes.

A microscopic examination of several of these vessels revealed similar changes, chiefly consisting of extremely violent, "simple arteriosclerotic changes"; in a few cases, however, a very pronounced round-cell infiltration in the adventitia of the vessel was observed, a phenomenon which would be quite unusual in a simple arteriosclerosis. The question, then, arises—can one help bringing

these inflammation cells which, naturally, must be associated with the intracerebral inflammatory changes, into a causative connection with the arteriosclerotic changes so that, at least a great many of these following upon the inflammation, may be considered to be secondary.

The chief reasons why we associate the different changes we have mentioned with encephalitis epidemica are as follows:

1. The cases are found beforehand clinically, the changes in the spinal fluid serving as a clue.

2. The changes are identical in the different cases.

3. According to what several unprejudiced and experienced investigators versed in general pathological anatomy admit, inflammation must be present.

4. The changes are most pronounced in those places, where encephalitis epidemica is customarily localized, thus, they are not general, as would be expected if the cause was a general one.

5. In a few cases, in addition to the above named vascular changes, the usual changes peculiar to encephalitis epidemica were observed.

6. In some cases of chronic encephalitis epidemica in younger individuals, similar vascular changes were found.

However, this is not the place for entering upon a closer or more detailed discussion of the subject which, therefore, must be postponed. A discussion of other changes more especially such as are almost constantly found in the kidneys, must likewise be held over. We will only emphasize here that in future, when cases of emollitio cerebri are examined, attention must be focussed on encephalitic changes, and a purely macroscopic diagnosis should not be accepted beforehand. However, as has been mentioned before, we hope later on to be able to return to these latter types in greater detail.

Below, we state briefly the reasons which go to support our supposition that the above mentioned cases are due to encephalitis epidemica:

1. Simultaneously with an outbreak of encephalitis epidemica, there is an increase of special cases.

2. The cases show similar changes in the spinal fluid corresponding with the findings anticipated in cases of inflammation.

3. The cases show a great number of symptoms which must be due to lesions found in those parts of the brain, where encephalitis epidemica as a rule localizes itself.

4. In groups also, the cases show great reciprocal resemblance from a symptomatological point of view.

5. In a very considerable number of cases, the subsequent course

of the disease, or the sectional changes, have shown that it was really a question of encephalitis.

A further link in the chain of proofs will be the future demonstration that cases of the type described above show a tendency to decrease together with the decline of encephalitis epidemica, just as they increased together with it. Finally, the definite course of the disease and, eventually, a post-mortem examination, will tend to support the diagnosis in a still greater number of cases.

Considering the overwhelming number of essays on encephalitis, it will be impossible to give bibliographical references here. *Achard,* in his book: "L'Encéphalite léthargique" (towards the end of 1921), mentions about 1000 articles on this subject. However, although we do not refer to any of the literature on encephalitis, we do not pretend that all the statements made in this lecture, should be considered to be original. Atypical cases have, of course, been observed everywhere. The chief merit of this treatise consists in the comparison between the states before, and during, the encephalitis epidemica, based on objective examinations of the spinal fluid which have led to the results described above.

The investigation is being continued, all the brains, especially of older individuals being subjected to a methodical examination, those however excepted, where it is quite obvious that death was not caused by encephalitis. Up to the present, that is to say, towards the end of 1924, inflammation and vascular changes of the character described above have been demonstrated in from 75 to 80 brains, while, in about the same number of brains taken from persons of the same age, no such findings were obtained; in older individuals, however, simple, arteriosclerotic changes were observed. These researches reveal a decided similarity with the earlier findings, though as yet, no pronounced indication of a decrease of the number of cases has been evidenced. However, this was hardly to be expected, for there are many other indications that encephalitic infection is still very extensive in Copenhagen. Moreover, very considerable numbers of atypical cases of encephalitis which, in a symptomatological respect, correspond entirely with the above, are frequently found.

BEHAVIORISTIC ATTITUDES CAUSED BY SPEECH DISORDERS

By May Kirk Scripture, B.A.

DIRECTOR OF SPEECH CORRECTION, VANDERBILT CLINIC, COLUMBIA UNIVERSITY; LECTURER IN SPEECH DISORDERS, NEW YORK UNIVERSITY, TULANE UNIVERSITY AND THE UNIVERSITY OF CALIFORNIA

AND

John A. Glassburg, M.D.

LARYNGOLOGIST, ST. JOSEPH'S HOSPITAL, AND ASSISTANT VISITING LARYNGOLOGIST, NEW YORK CITY CHILDREN'S HOSPITAL, RANDALL'S ISLAND, N. Y.; SURGEON, EAR, NOSE AND THROAT, STUYVESANT POLYCLINIC

Life is an acquisition of habits. The habits acquired are necessarily from those about us and they adjust us for our work and happiness in our particular group or herd. Early education is essentially a process of imitation and with the dawn of consciousness we begin to learn by copying the actions of others.

The infant imitates the sounds he hears and finally as he grows older masters the complicated series of movements necessary to produce speech. The speech which he thus acquires will be the speech that happens to have the strongest claim upon his auditory sense. Along with his speech he acquires the manners, the habits and all the standards of thought and acts peculiar to his group and station in life.

The Herd Instinct and Speech Habits. We are all familiar with many aspects of this herd instinct,—the wish to be "in line with other folks" and be in "style." There is a popular standard of behavior to cover practically every activity of our daily lives and by our adherence to such standards we constitute ourselves one of the group living by those particular standards.

It is therefore possible to judge an individual's social status by observing his actions. The parvenu and the nouveau riche betray their early positions by the adherence to a set of reactions different from those of the group to which they seek admittance, the Latin's reactions differentiate him from the Anglo-Saxon and the college man's training gives him a standard of behavior which to a stevedore appears ridiculous.

The Geographical Influence on Speech. In the realm of speech, this gregariousness is evidenced by the close adherence to the particular modes of speech adopted by the various groups. Leaving out

that particular social stratum which has acquired its speech from colleges or through other cultural medium and speaks in the approved manner of educated and enlightened persons all over the world, there are an infinite number of variations of speech habits according to learning, occupation and especially locality.

Local idioms, brogues, dialects and inflections exhibit extraordinary variations from the accepted standard of English speech. The Highland Scot and the Lowland Scot each has his own distinguishing peculiarities of speech. The Devonshire farmer and the London cockney speak an English that is almost entirely different. In Italy there are so many local dialects that neighboring districts have difficulty in understanding each other. The man from Vermont speaks with a twang that distinguishes him from the Bostonian. Thus the Southerner and the Westerner exhibit language peculiarities characteristic of their own native locality.

The mode of speech indigenous to the locality is considered correct and proper by the natives, and any other style of speech is felt to be foreign. If a Virginian should speak with the hard tone and broad A common to the New Englander he would be considered affected and "putting on airs." The expatriated native who has traveled abroad and acquired foreign speech habits upon returning home must be careful to speak with the brogue of his homeland or lose caste among his fellow townsmen.

Occupations and Speech Habits. Coming closer to home, we observe within our own community many standards of speech. There is the speech adopted by the wealthy and fashionable set which to the ear of the great middle class seems artificial and "highfalutin." A certain preciseness of articulation is characteristic of the professional classes, while a rude carelessness is the outstanding feature of the speech of the laboring classes.

The speech of these latter classes is also characterized by inaccuracies which would appear to be due to lack of education. Careful consideration reveals that these inaccuracies are rather in the nature of idiom or style. Even when these folks have been taught pronunciation and grammar they insist upon throwing aside every rule of correct speech and continue to talk in the idiom of their environment. It is because their form of speech is the insignia of their group and is worn with an unconscious sense of loyalty to their herd.

This type of speech is generally accompanied by a harsh unmusical and slovenly enunciation. Vowels are flattened, syllables are clipped, words are slurred together and English as it is spoken by the masses becomes a succession of unlovely sounds and inaccurately expressed

thoughts which is a sore trial to the sensitive ear and the trained intellect.

The Class Room and the Development of Speech Habits. One of the great problems of education is to lead the child to realize that the things he is taught in school are to fit him for real life. The child considers that school and all it implies is a separate and distinct part of his life. It never occurs to him to apply his lessons to his outside activities. This is well illustrated by the answer of the boy who when asked "Why don't you speak the way they teach you in school?" replied, "Aw, dat's de way dey talk in books. I ain't gonna talk so silly."

In the large classes to whom incorrect speech is common, it is useless to expect a child to acquire a grammatical and melodious manner of speaking unless the teacher can implant in him the thought that good English is preferable to the prevailing dialect. "Ain't" is no easier to say than "I am not" but unless the child is made to feel that the latter form is in some way better than the former, he will invariably revert to the incorrect form the moment he leaves the school room.

The Strangeness of Correct Speech. The child's auditory sense should be accustomed to correct speech so that a lasting impression be made upon his mind. For after all, it is the effect of strangeness which prevents the adoption of good English. A boy feels that it is "sissified" and would be ashamed to talk so to his "fellers." He should have his ear so attuned to correct speech while in the class room that some echo of it will last him through the various stages of his development and reassert itself in later years.

The speech of the school room should not have any flavor of the pedantic or meticulous but each word should be carefully pronounced, the vowel sounds given their full value and every thought expressed in simple everyday language, such as the child himself is apt to use. It is useless to lecture the children upon the benefits to be derived from the practice of correct speech, but it should be possible to bring to realize how easy it is to talk properly and by the constant use of good speech in the school room overcome the sense of strangeness.

The influence of Speech Disorders on Behavior. We have so far treated only of the effects of behavior on speech, but the problem of speech disorders is a two edged sword which cuts both ways. We think in words. Consequently a child to whom a sadly degenerated offspring of our language becomes the habitual mode of speech is greatly handicapped in his intellectual development. The meager vocabulary, the inexact and poorly expressed ideas, the slovenly

diction, all tend to mold the mind into the acceptance of the prevailing limited ideas and prevent clear and initiative thinking.

Many children are considered mentally retarded, backward or even feebleminded because of a speech defect. Inferiority complexes, shut-in personalities, shyness, timidity, maladjustment, criminality and anti-social characteristics are some of the results of the disturbances of speech.

After studying thousands of delinquent children William Healy of the Juveline Psychopathic Institute of Chicago says: "We have been tremendously impressed with the influence which a speech defect has upon the personality of the offender. We entirely agree with several authorities who state that the tendency of stuttering is to make the individual highly anti-social. The victim of this annoying disorder looks upon himself as very different from others of his kind. . . . Thieving, vagrancy and homosexual practices have in consequence been indulged in."

Speech Disorders as a Cause of Mental Deficiency. Speech is used as one of the indicators of intelligence. A limited vocabulary means a limited means of expression and thinking. A speech defect not only limits expression but may even prevent it. The most common types of speech disturbances that are instrumental in doing so are stammering and stuttering.

Samuel G., nine years old, presented himself with a diagnosis of feeblemindedness of the moron type.

Physical examination revealed a well nourished, well developed boy. There were no gross deformities, paralyses or atrophies. The cranial nerves were intact. The heart, lungs and abdominal viscera were negative. The voice organs showed no gross pathology. The superficial, deep and organic reflexes were intact. The station and gait were good.

The mental history was of particular interest. The boy had started public school at the age of six, having been for one year previous in the kindergarten. His progress had been normal and he reached the 2B grade at seven and a half years. Then he stopped and ever since made no further progress. At the time of our examination though nine years old he was still in the 2B grade and about to be transferred to the ungraded class for mental defectives. The Terman psychometric test showed an actual age of nine and a mental age of seven years four months with an intelligence quotient of 72. Apparently it was a clear case of mental deficiency.

The boy, however, was a stutterer. A detailed history brought out the facts that at seven years of age after being run over by a taxicab he had begun to have difficulty in speaking. That was six months before he ceased to advance in school. In addition, the mother stated that he was highly "nervous" by which she meant emotionally unstable.

Samuel was willing, anxious, but incapable. His fund of general information was good, his judgment when not impaired by his speech defect was fair and though he would give an incomplete or wrong reply to some of the

absurdities asked there seemed to hover over his face a contradictory expression of understanding. He was very poor at figures and had almost no number concept.

The great disparity between his general responses and his deficient arithmetical ability aroused our suspicions and we thoroughly investigated this phase with the result that we discovered that the boy really knew the answers to the problems set to him but because of his speech defect could not express himself. For instance, when asked, "How much are eleven and eleven?", he would get red in the face, stiffen up and blurt out "t-t-t-two," and sit down in despair. As a matter of fact he meant twenty-two but because of the stuttering he could not make himself give the correct answer.

The diagnosis of feeblemindedness was changed to mental retardation due to speech defect. The boy was put on speech reëducation. Under encouragement and proper training he gained poise, gradually overcame his stuttering and began to make normal headway in school.

Speech Conflicts Affecting Behavior. In the big cities of our country where there is a large foreign population there is a curious but nevertheless serious form of speech defect caused by the attempt to adhere to the mother tongue and at the same time speak in English. Such persons think in one language and talk in another. This conflict between the old and the new forms of speech prevents free expression, engenders hesitation, causes the substitution of foreign words, perverts meanings and produces general confusion and inability to be understood. As a consequence a secondary emotional disturbance is developed which may range from a simple embarrassment to a deep depression dependent upon the temperament of the individual. Not infrequently, due to the instability, stuttering may set in. These polyglots then have not only a definite speech defect but also a marked change in personality. They may appear slow, dull and stupid.

Victoria S., eleven years old, was brought for commitment to an institution because of her inability to get along in school.

Physical examination revealed a highly emotional child, who blushed easily, cried on the least provocation, was very fidgety and restless, did not sleep well and revealed a marked dermographia. She was undernourished, anemic, her hemoglobin being only 55, and of weak musculature. There were no gross deformities, paralyses or atrophies. The heart, lungs and abdominal viscera were negative. The cranial nerves were intact. She was a mouth breather due to enlarged tonsils and adenoids. The superficial and deep reflexes were very lively. The station and gait were good.

She had started school at six and had been demoted many times, being now only in the 4A instead of the 6A which was the proper grade for her age. The complaints from school were that she lacked comprehension, could not concentrate, and her speech was often unintelligible.

The Terman psychometric test given by us showed an actual age of eleven and a mental age of nine with an intelligence quotient of 74. Ordinarily this child would have been diagnosed as mentally deficient but when we went into the social history we found enough handicaps to account for her backwardness.

Victoria had come to this country from Italy at the age of six and was living in the Jewish quarter of the city. It was of special interest to find out that she had learned Yiddish in the streets, by being sent to the neighborhood Jewish grocery on errands, and from her playmates, before she had learned English in school. When she entered school she presented three conflicting language elements, the Italian spoken at home, the Yiddish spoken in the neighborhood and the English to be acquired at school.

The consequence was that she thought in one language and when trying to express herself in another became flustered, confused and unintelligible. This caused an embarrassment, a disturbance of the affective mechanism, an impairment of the intelligence and at our examination not only a definite speech defect but an emotional instability.

Our diagnosis was mental retardation due to emotional instability, speech defect and poor environment. The girl's tonsils and adenoids were removed, her nutrition was attented to, means were taken to overcome the anemia and special speech reëducation methods were instituted.

The girl responded very well to treatment. The emotional instability was reduced, she gained confidence and gradually began to forge her way ahead in school. A complete cure of her defective speech could not be obtained because of the constant relapses into her old habits caused by her environment. If this child could be taken away from her home, away from where Italian and Yiddish are constantly spoken and heard and put in an English speaking atmosphere we feel confident that she would be easily and perhaps spontaneously cured.

Conclusion

Behavior influences speech and speech influences behavior. When the former is the case it is usually beyond our scope as speech specialists to bring about a cure or an amelioration but when we are confronted by the latter condition we can, by overcoming the speech disorder, change the attitude, behavior and personality and readjust the individual to his surroundings.

Speech defects are curable and the sooner the treatment is undertaken the better the results. This should be impressed upon physicians, teachers, parents and those who believe that the condition is either hopeless or that it can be "outgrown."

Finally a course in the reëducation of speech is a course in mental and physical hygiene. Relaxation, proper breathing, good posture, muscular development, poise, equanimity, self-control, mental balance and clear thinking are some of the results. In brief, speech reëducation is character building.

20 Fifth Avenue, New York City.
103 East 10th Street, New York City.

SPINAL CORD TUMORS *

Report of Six Cases Including Tuberculoma of Dura

By Max H. Weinberg, M.D.

ASSISTANT NEUROLOGIST, WESTERN PENNSYLVANIA HOSPITAL, PITTSBURGH, PA.

Tumors of the cord and its environs, the meninges and the spinal column, in spite of intensive study by neurologists the world over, are still offering many difficulties in diagnosis.

Writers on the subject practically all agree not only that the differentiation between intra- and extramedullary tumor is at least difficult if not, at times, impossible, but that the diagnosis of tumor in itself is quite difficult and many cases are often overlooked. Thus Williamson,(1) in discussing this subject, warns his readers to consider the possibility of a tumor in case of spinal disease. Elsberg,(2) in pleading for early recognition of these cases, speaks of many cases with spinal cord tumors who give a history of having had pain from a few months to several years, and cites four cases that have been operated on for various abdominal and rectal operations, which eventually proved to be tumors of the cord. DeSanctis (3) says: "We have not become more capable in diagnosing these conditions in spite of our refinement of our methods of clinical neurologic investigations." Rand (4) also sounds the same note of warning, with the statement that many cases of cord tumor have had many conflicting diagnoses and mentions many conditions for which they were mistaken.

This difficulty is increased manifold in late cases when the compression syndrome is fully established. In such cases we have to depend on a careful analysis of the history of the patient, which in the great majority of cases proves to be incorrect and misleading. The patient cannot be altogether blamed for this either, because he is more apt to lay stress on symptoms which annoy him greatly and overlook minor occurrences at the very onset of the disease. Then, again, we may in our desire to find corroborative data, attach a great deal of importance to a symptom which in reality had no connection with the case in point. As an illustration, there is presented my ex-

* Read in abstract before the New York Neurological Society, March 3, 1925. From the service of Dr. W. K. Walker.

perience in Case 6. The patient, after careful questioning, gave a history of having had shooting pains in the left thigh, which she called "neuritis," two years before. I seized upon it as a definite root pain which occurred early, and this is what helped me in a measure to determine the diagnosis of an extramedullary tumor. While the tumor was found at the spot localized, I was later convinced that the early pains had nothing to do with it, the tumor being a tuberculoma of rapid growth and really did develop within a period of six weeks as the patient had claimed at first. In connection with this, Stookey's (5) experience is of great importance. Stookey reports twenty cases of extramedullary tumor, many of them occurring at the same site, and yet the presenting symptoms were never alike.

Taking all these things in consideration, it behooves us all to study every doubtful case very carefully, and to elicit all the possible facts in the development of the condition.

It is for this reason that I feel justified in reporting this small series of cases, six in all. Only four of the six came to operation and were verified. The two that refused operation remain as suspected cases. The four verified cases represent practically all the possible sites of tumor. One was a tumor of the sixth vertebra causing compression of the cord; one was an intramedullary tumor; one was a tumor of the cauda equina; and the last one was a solitary tuberculoma of the dura opposite the third and fourth segments of the cord.

Case Reports

Case 1. W. B., age twenty, male. Hosp. No. 2893. Adm. 7/14/19. Died 12/19/19.

C.C.—Inability to walk. Numbness in legs.

F.H.—Father living and well. Mother died, nervousness(?). One brother and one sister living and well.

P.H.—Measles, mumps and diphtheria in childhood. Tonsilitis seven years ago. Denies venereal disease.

Habits—Does not use tea, coffee, or alcohol.

Analysis of C.C.—Onset two months before admission—gradual. Patient first noticed a stiffness in the quadriceps femoris muscles on both sides, but more marked on right side. Condition became gradually worse until he had to drag the right limb in walking, and the farther he walked the more marked became the "stiffness," and, finally, the entire limb became useless. One month ago the patient went to C. hospital. At the hospital a blood Wassermann and spinal fluid examination were made and the reports were negative, he states. Following the spinal puncture he developed a dull pain in the back which subsided in six days. After the spinal puncture he also had retention of urine and had to be catheterized twice. He also has constipation. He is now able to move his limbs but slightly, namely, he has some slight power in the extensor muscles of the thighs, but he cannot flex them.

On physical examination, the cardio-respiratory apparatus was found to be negative. No trouble found in bones or joints.

Neurological examination 7/14/19—Pupils slightly irregular and unequal. React to light, consensual, sympathetic, and in accommodation. Cranial nerves are normal. Power of hands good. Reflexes, elbow jerks, radio periost., and triceps, normal on both sides. Knee jerks both increased, right more than left. Babinski and allied signs positive. Ankle clonus marked on right, exhaustible on left. Patellar clonus present on both sides, more marked on right.

Sensory—There is an area of analgesia extending up to about one inch above umbilicus anteriorly and first lumbar posteriorly. Temperature sensation completely lost in the same area. In the sacral region there is hypesthesia only. Tactile—intact all over lower part of body. Deep sensibility slightly disturbed. No tenderness along spine.

7/16/19—Patellar clonus on right exhaustible, on left absent. All other signs still present. Upper abdominal reflexes sluggish, lower absent. There is a well marked Sergeant line. Pubic hair distribution distinctly feminine in type.

7/21/19—Patellar clonus returned. Deep sensibility disturbance is more marked. Vibratory disturbance is lost altogether.

7/23/19—Reflex spasms in the right leg for the last three days. Area of analgesia extends only up to about one inch above Poupart's ligament. Hypalgesia extends up to above umbilicus, but is less marked than previously.

7/24/19—No change in sensory disturbance since last examination. Patellar clonus disappeared on both sides. Right ankle clonus almost disappeared, left unchanged. Right knee jerk not as markedly increased as before. Other reflexes show no change.

8/3/19—Right K.J. not as marked as previously. Left K.J. changed but little. Ankle clonus absent on left, very slight on right. No change in sensory findings since the last examination.

8/18/19—Right K.J. not as marked as before. Right ankle clonus exhaustible. No patellar clonus on right. Spasticity on left very marked. Right Babinski still present, but none of the other toe signs are present. Pain perception present above Poupart's ligament, but duller up to area of third lumbar vertebra.

8/25/19—Patient states that for the last few days he is not aware of passing his urine, although he feels the desire for urinating. Was unable to keep back his bowel movement yesterday, while waiting for bed pan.

9/3/19—Marked trophic changes on soles of feet. Ankle clonus exhaustible. Babinski and concomitant signs present on both sides. Patellar clonus present on right only. Mendel-Bechterew present on right side. Lower abdominal reflexes absent. Anesthesia extends three inches above umbilicus, anteriorly.

9/26/19—No change in neurological picture. Diagnosis of cord tumor made. The tumor was suspected in the area of the seventh to the ninth thoracic segment, as my notes made on the date of 9/27/19 immediately following the operation indicate. These notes read as follows: "Patient operated upon. Cord exposed over seventh, eighth, and ninth segment, but no tumor was found. Cerebrospinal fluid not under tension. Patient left operating room in bad condition of shock, but revived on being stimulated."

The note made by the surgeon at the operating table reads as follows: "Eighth, ninth, and tenth thoracic vertebræ removed. Cord exposed over ninth, tenth, and eleventh segments. Grooved director passed up two inches above exposed cord—met no resistance. C.S. fluid clear and not under increased tension. Appearance of cord normal."

Post-operative notes were kept up, but no neurological examination could be done until 11/12/19, when the following notes were recorded: "Anteriorly there is definite anesthesia extending up to the tenth rib. On the left it is

FIGURE 1. Picture of cord showing constriction of segment of cord underneath tumor.

about one inch lower. Right posteriorly the level is about the same, ninth dorsal vertebra. Left posteriorly, the level is between the eleventh and twelfth dorsal vertebræ. The patient notices himself that there are muscle jerks. He is markedly emaciated. Reflexes are very active. Marked trophic changes—ulceration wherever there is pressure.

"The patient kept on getting worse. He developed marked decubitus and died 12/19/19. Autopsy was held."

Pathological Report—Spinal cord: An old healed sore is present over the region of the eighth, ninth, tenth, and eleventh vertebræ. The spinous processes of the eighth, ninth, and tenth vertebræ are missing. The scar tissue is

only lightly attached to the dura and there is no compression or involvement of the cord beneath the scar.

In severing the laminæ of the sixth and seventh vertebræ, the bone is very spongy and dark red in color. It has a cavernous appearance, with the cavities filled with blood. There is some protrusion of the bony wall into the lumen of the spinal chamber at this point. The wall is smooth and dark colored. The sixth vertebra between the sixth and seventh ribs shows slight enlargement of its body. This is more noticeable on the right side of the

FIGURE 2. Microphotograph of affected vertebra. Hemangioma of sixth thoracic vertebra.

body than on the left. On the right side just posterior to the azygos vein is a small protuberance, size of a small split pea, which is firm. Otherwise the body is perfectly smooth.

The cord seems normal except for a constriction with marked softening opposite the sixth vertebra.

Laboratory Reports—The urine was negative for the first two months of the patient's stay in the hospital, but all specimens examined after the operation showed a faint trace of albumin and numbers of white blood cells per H.P.F. varying from ten to thirty.

7/15/19—Differential blood count. W.B.C. 7,150. Polys 61 per cent, S.L. 33 per cent, L.L. 5 per cent, Eosin 1 per cent.

7/17/19—X-ray of spine. No evidence of bone pathology or trauma.

7/29/19—Blood Wassermann—negative.

9/9/19—Spinal fluid examination. Wassermann negative. Cells per cmm. 5. Globulin positive. Fluid clear. Gold curve 0000000000.

9/29/19—Differential blood count. Hb. 85 per cent, R.B.C. 3,200,000, Polys 81 per cent, S.L. 15 per cent, L.L. 2 per cent, Trans. 2 per cent.

Case Summary—Several points of interest come up for consideration. It took somewhat longer to arrive at a diagnosis in this case, mainly because of the shifting sensory changes that we found at the various examinations. While the anesthesia up to about Poupart's ligament was fairly permanent, the hypesthesia which extended up to above the umbilicus was not constant, and in fact was less about one month after admission than when first examined. The patchy character of the anesthesia in the sacral region posteriorly also tended to confuse me. It is for this reason that while I felt certain of the diagnosis of tumor, I could not definitely decide on a level, and the case was protracted for further observation.

The remissions in the intensity of the spastic phenomena at first also tended to confusion, but later on these symptoms became progressively worse.

After diagnosis was finally made, there was an unfortunate slip up somewhere between the neurological and the surgical departments. It seems from my notes that the cord was to be exposed over the area of the seventh, eighth, and ninth segments, while the surgeon reports the removal of the eighth, ninth, and tenth dorsal vertebræ. Fortunately, this slip did not matter much as far as the outcome of the case was concerned, since the tumor was an inoperable one, but it has to be looked upon as a failure in localization all the same.

Another point of interest in this case is the fact that early in the disease when the patient was still in the other hospital, his condition became aggravated following a lumbar puncture in that he had pain in the back which lasted for six days, and he also had temporary retention. Climenko (6) attaches a great deal of importance to this finding. Dandy (7) is so much impressed with it that he thinks lumbar puncture alone is not a procedure of merit.

Curiously enough, we noted no change following the lumbar puncture we did about two weeks before operation. This indicates that the point that Stookey (5) makes in this connection is well taken. He thinks that there is possibly a critical moment at which withdrawal of fluid brings this about. In this case, once the symptoms were well established, there was no aggravation of symptoms.

The lack of tenderness to percussion of the spine was another misleading factor. Authorities agree that tenderness to percussion is rather common. Ehrenberg (8) points out that tenderness to percussion of the vertebræ overlying the tumor is of diagnostic importance. Abrahamson and Climenko (9) in their discussion of differential diagnosis between extra- and intramedullary tumors say: "Deep spinal column tenderness indicates rather an extramedullary tumor."

This case, especially, on account of the disease process being in the vertebra itself, on first thought, should have exhibited tenderness on percussion, but such was not the case. This may perhaps be explained by the fact that the disease was in the body of the vertebra, the part most distal from the point of irritation. However, after reading Stookey's (5) experience this is no longer a puzzle to me. Stookey reports that but one case out of seven of vertebral tumors exhibited tenderness, and in that case the tenderness was below the seat of the tumor and overlying the compressed segments of the cord.

The fatal result was caused as is usual in these cases, by infection of the urinary apparatus and decubitus due to trophic changes.

Case 2. Mrs. M. A. Age fifty-seven. Hosp. No. 8548. Adm. 4/29/20. Disc. 6/6/20. Died about one month later at home.

C.C.—Numbness of body. Headache. Feet feel light and clammy.

F.H.—Husband dead from cause unknown to patient. One daughter living and well. Four miscarriages. No history of organic nervous disease in the family.

Analysis of C.C.—She has not felt well since January, five months before admission. At that time she was very drowsy and complained of her stomach being "tied up in a knot." Her body feels numb and cold. This sensation was experienced first in her arms and hands. At the present time it is in her feet. She says her feet feel big and as if they had putty on them. She also complains of her knees. She says that the knees feel big and as if her legs were detached from her knees down. She has a sensation in her abdomen which she describes as a pulling "as if her intestines were being twisted in a knot."

She had trouble with her ears since she was seventeen years old. She had a miscarriage at that time and was deaf for a while. Her hearing came back later. She had four successive miscarriages and had trouble with hearing after each of them. Her hearing remained poor for the last twenty-five years. She can only hear unusual noises such as a dog barking. There was at no time a discharge from the ears.

Cardio-respiratory system negative. Frequent headaches.

5/8/20—Neurological examination by Dr. Walker. Patient says "feet feel as if they were in mud." She is always cold. Claims that she feels as if she is going to vomit but does not. Feels lightheaded and as if her head were leaving her body, and as if she were floating in water.

Pupils equal 3½ by 3½ mm. No irregularities. Respond promptly to

bright light. No nystagmus. Tongue protruded in median line. No facial paralysis. E.J. right slightly exaggerated. E.J. left same. K.J. right normal, K.J. left normal. Babinski marked on right, and less on left. Chaddock and Oppenheim present on both sides. Ankle clonus negative both sides. Achilles normal on both sides.

5/14/20—There was a fairly marked spastic syndrome. K.J.'s and achilles were increased. Hypesthesia of lower extremities more marked in left leg, and extending up to gluteal fold, then hyperesthesia extending upward for about three inches. Deep joint sensibility disturbed. Tactile disturbed more on the opposite side. Thermohypesthesia in the same distribution as the pain. Never had bladder or bowel disturbance.

Diagnosis—Probably cord tumor, extradural about the twelfth dorsal. Some pathology of bone may be present.

5/20/20—Patient seems to have anesthesia dolorosa over the anesthetic area. Vibratory sense diminished up to about the eleventh dorsal and this corresponds to the upper margin of the area of hyperesthesia.

Tumor of the cord is the most likely diagnosis. Location in posterior column extending laterally to right mainly.

6/3/20—Vaginal examination by Dr. L. H. Landon.

No perineal relaxation. Cervix small—uterus retroverted, but no relaxation of utero-sacral ligaments. No tenderness of the tubes or ovaries. The uterus is moderately fixed in retrodisplacement. No suggestion of malignancy.

6/5/20—No change in the condition except that ankle clonus on the right is increased.

5/8/20—Blood—R.B.C. 3,392,000. Hb. 70 per cent, W.B.C. 7,200. Poly's 36 per cent, S.L. 35 per cent, L.L. 26 per cent, Trans. 1 per cent, Eosin, 2 per cent.

4/30/20—Urine exam. negative.

5/1/20—Blood Wassermann negative.

5/8/20—Spinal fluid examination. Wassermann negative. Cells 1 per cmm. Globulin negative. Clear fluid. Gold curve 0000000000.

5/21/20—X-ray—Small decalcified area in the right pedicle of the eleventh dorsal vertebra. Shadow suggestive of gall stones. Reëxamination shows no evidence of bone pathology.

Case 3. Mrs. A. L., age forty-one. Hosp. No. 2613. Adm. 10/1/21. Disc. 10/9/21.

C.C.—Gastric girdle pains so severe that they prevent sleep. Cramp-like pains. Temporal headache. Constipation. Incontinence of urine. Burning micturition.

F.H.—Could not be obtained.

P.H.—Has no children. Married seventeen years. No miscarriages. Had some abdominal trouble at age of thirteen, but never was operated upon.

Analysis of C.C.—Has been sick for past two and a half years. Has not been able to go about for seven months. Her first complaint was the girdle pains which were subsequently followed by her inability to walk. Greatest weakness appears to be in the knees. Cramp-like pains in the limbs. Arms not affected. Has severe temporal headaches which come and go. Never vomited. She is very constipated and sometimes goes five to six

days without having a bowel movement. Complains of burning micturition and inability to start stream. Has also incontinence. Complains of needle-like pains in limbs. Lower extremities feel cold. Lower limbs become flexed. Dreams a great deal. Hears voices of her relatives in "the old country" about her. They say "she is too lazy to walk, does not want to get up." Husband was killed two years ago and she dates all her troubles since that incident. Thyroid enlargement dates back to that incident.

10/5/21—Fairly nourished woman. Dark pigment around the eyes. Pupils react well. Nose and ears negative. Teeth fair. Tongue heavily coated, tremulous, in mid-line. Thyroid greatly enlarged, both lobes as well as isthmus being involved. Acne in chest region. Chest well developed. Expansion good. Abdomen fairly normal except for tenderness over bladder and some rigidity. Right knee is flexed. Ankle clonus positive on both sides. Babinski positive. E.J. exaggerated, sets whole body in fine tremor. Abdominal reflexes present.

10/7/21—There is a definite VonGraefe. Grip of both hands good. Right E.J. and both R.P.'s markedly exaggerated. Abdominal reflexes very much diminished. Spasmodic drawing up of legs (spinal epilepsy). Patellar reflexes cannot be obtained. Ankle clonus very pronounced. Babinski positive in both sides, extremely marked. Gordon, Oppenheim, and Chaddock positive. Tenderness to percussion over tenth and eleventh vertebrae. Anesthesia to pin prick up to about tenth vertebra posteriorly. Temperature sense lost over same area as anesthesia, except right outer hip. Vibratory sense felt all through, but diminished up to eighth dorsal. Deep joint sensibility completely lost. Anteriorly the anesthesia extends up to about an inch below the xiphoid cartilage.

Diagnosis—1. Cord tumor, probably situated laterally to the cord involving the roots at the level of the seventh thoracic segment. 2. Possibility of T.B. of spine.

10/8/21—The patient refused to have X-ray picture taken. She also refused to use the air cushion which was ordered to prevent bed-sores. A day later she left against our advice and the case never came to our attention again.

Laboratory examinations: 10/1/21—W.B.C. 6,600. Blood Wassermann—negative.

10/1/21—Urine—negative except for a few granular casts.

10/3/21—Non-protein N. 32, Urea N. 14½, Uric acid ?, Sugar 102, 108, 89.

10/3/21—Spinal fluid examination—Wassermann negative. Globulin heavy. Fluid—xanthochromic and clotted. Cell count not reliable. Colloidal gold 0000001122.

Case Summary—Cases two and three can at best be diagnosed as most probably cord tumors. Both patients left the hospital without giving an opportunity to study their cases thoroughly. In case two, the question of syphilis had to be given consideration, mainly because of the history of four miscarriages and the long standing bilateral deafness. The normal pupils, and negative Wassermann in both the blood and spinal fluid are against the diagnosis of lues.

The possibility of encephalitis of a so-called spinal type also had

to be given consideration, on account of the history of drowsiness at the onset and the frequent headaches. There being, however, no evidence of cranial nerve involvement whatever, encephalitis can be considered as extremely unlikely.

Could this be a case of multiple sclerosis with marked sensory changes? Most likely not. The advanced age of the patient, the complete absence of cranial nerve involvement, and tremors of any kind, I believe, preclude the possibility of that condition.

In favor of cord tumor is the presence of fairly marked spastic syndrome in the right leg with tactile disturbance in the same side, and pain and temperature disturbance of the left leg, with a belt of hyperesthesia above the area of hypesthesia. Another factor in favor of diagnosis of tumor is the diminished vibratory sense of the lower extremities and the spine extending to the upper margin of the area of hyperesthesia. I find this a fairly reliable sign in such conditions and it nearly always corresponds to the level of the tumor. Abrahamson and Climenko (9) give this as one of the valuable signs in the diagnosis of cord tumor. The possibility of bone disease and pelvic tumor was definitely ruled out.

We had even more difficulty with case three. This patient refused to coöperate and in fact left the hospital after a stay of a few days only. Again, this is a case where both the diagnosis of tumor and the probable level are mere conjecture. But, the history of girdle pains, the fairly definite sensory level, namely, pain and temperature anesthesia, diminished vibratory sense up to about the same level, although slightly higher, tenderness to percussion, spastic syndrome including reflex spasms of legs, and commencing contracture in flexion, the severe obstipation, and the urinary retention, and the marked Froin syndrome in the spinal fluid are fairly indicative of a tumor of the spinal cord, most likely extradural. This patient even refused X-ray examination, so such condition as tuberculous spine or other bone condition could not be ruled out. The Wassermann was negative in both the blood and spinal fluid. She had some mental symptoms which could be attributed to shock following the killing of her husband.

Case 4. Miss M. K., age twenty-seven. Hosp. No. 5296. Adm. 12/6/20. Died 3/5/21.

C.C.—Frequent micturition. Partial loss of motion of legs. Does not feel lower extremities.

Analysis of C.C.—For the last two years, she has had frequent micturition with inability to control bladder function. Voids every fifteen minutes. Feels the sensation but cannot hold it. For last year has begun to lose control of feet. Can stand up but not walk very fast or go upstairs. Has noticed

that she has had no feeling in the lower extremities and this is getting worse. She feels numb. Does not complain of pain or palpitation. Is somewhat nervous and irritable of late. Has weak eyes and has been wearing glasses. Has occasional headache which is indefinite and irregular.

Patient says that at the beginning of her present trouble she experienced immediately after eating, a pain prickling in character which lasted for about a half to one hour. It was not severe and resulted in no discomfort. It comprised a bandlike area across upper part of abdomen. The patient thought that they were merely gastric discomforts.

12/10/20—Examination by Dr. Carson. Fundi negative. No central scotoma for red or green. Form fields by rough test seem of full size.

12/11/20—Pupils are regular, react to light sluggishly, well in accommodation. Abdominal reflexes absent. Deep joint sensibility not affected. All the deep reflexes of the legs are much increased. Babinski and Chaddock present. Ankle clonus bilateral, more marked on right. Vibratory sense in right almost all gone. Anesthesia up to knees on both sides, posteriorly to line across coccyx. Belt of hyperesthesia extending from third to sixth. Hypesthesia from line across coccyx to ninth dorsal.

Diagnosis—Neoplasm of cord localized at sixth thoracic segment.

12/12/20—Injected pilocarpin hydrochloride gr. 1/12 in muscles of arm. Face became flushed and perspiring. Perspiration visible in upper trunk fifteen minutes after injection. Perspiration extended from above, including face, neck, and upper trunk to line across nipples, anteriorly. In the back the perspiration extended down to about the sixth or seventh dorsal.

12/13/20—Patient has incontinentia a jet. Is constipated. The pilocarpine test made her very uncomfortable.

Operation was advised at the level of the sixth to the eighth thoracic segments.

12/15/20—Patient was operated upon by Dr. L. H. Landon. The following note was made at operation: Cord exposed underlying fourth, fifth and sixth thoracic vertebrae, or sixth, seventh and eighth thoracic segments. On opening the dura exactly opposite the fifth thoracic vertebra or seventh thoracic segment, there is a distinct spindle shaped bulging extending about 1½ cm. Cord rotated to dentate ligaments. No evidence of extramedullary compression.

Post-operative diagnosis—Intramedullary tumor of spinal cord (seventh thoracic segment).

1/8/21—Has had urine retention since first of month, requiring catheterization.

1/9/21—Twice to-day the patient had a feeling of fullness in the head followed by a sensation of heat starting from the head and going to the feet slowly. The temperature has gone up to 105 within four hours.

2/2/21—Patient noticed for the last two days pulling up of legs, reflex spasms. Diminished vibratory sense on right. Urinary and bowel control lost for a week now.

2/28/21—Patient complains of pain on swallowing.

3/5/21—Patient died at 7:45 P.M. from toxemia and cardiac decompensation.

Autopsy was refused.

Laboratory Report: 12/8/20—Urine: Albumen cloud, many granular casts.

1/14/21—Urine: Albumen present, 5 to 6 cells per H.P.F.

2/2/21—Urine: Albumen—trace, W.B.C. too many to count—large masses.

2/4/21—Urine: Albumen—light cloud. W.B.C. too many to count.

12/8/20—Blood Wassermann: negative.

12/8/20—Spinal fluid Wassermann negative. Cells 2 per cmm. Fluid clear. Gold curve 0130000000.

12/10/20—X-ray of spine—No evidence of bone involvement in the upper dorsal or lumbar region.

The temperature was with one exception normal up to operation. The post-operative temperature was not over 100 until the seventh of January, when it rose to 103 and two days later to 105 and from then on until her death was a typical septic temperature. Decubitus developed about two weeks after the operation.

Case Summary—This patient was treated over two years by several physicians for cystitis, ignoring entirely the other symptoms such as the progressive motor weakness and the subjective loss of sensory functions.

The diagnosis of tumor was fairly evident from the first examination. The question, however, of differentiation between extra- and intramedullary neoplasm could not be determined so readily.

It is conceded by most authorities that an absolute differentiation between intramedullary and extramedullary neoplasm is as yet impossible. Many criteria have been given, but always with the proviso that they are not absolute and might occur in a tumor at either site. Climenko (6) says: "When, however, cord pressure symptoms are well established, it is difficult to differentiate between an extra- and intramedullary tumor." Bing (10) in his book gives a long list of differentiating points between these two conditions, but concludes with the remark that not one of them is pathognomonic of tumor at either site. Fleck (11) says: "In reviewing our experiences, we learn that a sure differential diagnosis between intra- and extramedullary site of a tumor is in the state of our present knowledge impossible. On the contrary, we are more uncertain than before as a result of our experience."

In considering the differential diagnosis in this case, the difficulties are at once apparent. Pain, for instance, especially of a radicular character is considered as most likely associated with extramedullary tumor. Abrahamson and Climenko (9) state that pain in intramedullary tumor is present only when the tumor reaches the posterior roots or surface of the cord. Dandy (7) in his series reports three cases of intramedullary tumor which were all free from pain and in passing, remarks that it is not to be expected in this kind of

tumor. The pain that this patient complained of as occurring early in the disease was fairly typical of root pains. Even the fact that they disappeared altogether does not argue for an intramedullary tumor. Stewart,(12) in discussing pain, says that pains, even severe ones, may completely disappear. From the standpoint of pain then, we had more reason to suspect an extramedullary tumor.

The slow progression of symptoms is considered in favor of extramedullary tumor. Fleck (11) points out that rapid progression of symptoms speaks for an intramedullary tumor, and although he cites a case of intramedullary tumor of seven years' standing and in addition mentions a case of Von Stertz of ten years' duration, by Maas of one of fifteen years' duration, and one case described by Putnam and Warren of nineteen years' duration, he considers them as rarities. The symptoms in this case were of two and a half years' standing, and again, this feature pointed more probably towards an extramedullary diagnosis.

The sequence of events in the sensory disturbance is considered of importance from a diagnostic standpoint. Thus, Abrahamson and Grossman (13) say: "From the nature and distribution of the sensory loss we speculate on the position of the tumor, and particularly as to whether it is intramedullary or extramedullary in origin." Fleck (11) quotes Malaisé to the effect that dissociated sensation is the cardinal symptom of gliosis, but still it not infrequently occurs in meningeal and spinal column tumors. He also cites Fabritius, who maintains that a painstaking study of temperature disturbance in spinal cord disease must be given great weight and can probably in many cases help us arrive at a correct diagnosis between extra- and intramedullary tumor. Still this same author quotes Oppenheim, Thomayer, DeVie, Tolot, and Putnam-Warren as having described syringomyelic dissociation in extramedullary tumor.

The sensory changes in this case were not of such a nature in any event. The patient had pain and temperature anesthesia up to a level and above that hyperesthesia, vibratory sense—the first of deep joint sensibility to disappear according to Bing (10)—was gone on the right side. So that the sensory changes did not point towards intramedullary disease, is quite apparent.

The vasomotor disturbance as shown by the pilocarpine test was indicative of a tumor and perhaps pointed more strongly towards an extramedullary tumor.

Finally, the presence of fairly severe urinary disturbance early in the disease also was in favor of extramedullary pressure. And

yet, at operation the tumor was found to be intramedullary and inoperable.

Truly, one can agree fully with Fleck (11) who, after struggling with the question of differentiation between intra- and extramedullary tumor, says emphatically: "There is no pathognomonic symptom."

Case 5. A. L., age thirty-two. Austro-Hungarian. Hosp. No. 1070. Adm. 7/9/23. Disc. 9/20/23.

C.C.—Pain in back, hips and legs. Inability to urinate and walk without support. Cold extremities.

F.H.—Father and mother dead—cause unknown to patient. One sister alive and well. Two brothers died in infancy.

P.H.—Diphtheria. Usual childhood diseases. No operations or injuries. Menstruation began at eleven years, never regular, twenty-one days, lasts about seven days and is quite profuse and accompanied by much pain. Has three children alive and well. No abortions or miscarriages. Has had leukorrhea.

Analysis of C.C.—Present condition dates back to February 15, when the patient, while carrying a bucket of coal was suddenly seized with pain in lower back. Pain radiates to both loins and down lower extremities. Pain in the back is of a "jagging character." The extremities feel as if she had "gas" in them. Patient is much relieved from the pain in back when she sits up in bed. She must sleep in sitting position as the pain is excruciating when she lies down. The pain is made worse by lateral as well as antero-posterior movement of the spine. Since the onset, she has been able to walk only when aided by a cane. When she walks she feels her trunk move to one side as if the spine was dislocated. Walking increases the pain and it makes her feel as if everything were loose. Both extremities have been cold—first the right, and then the left. She has had retention of urine off and on, requiring catheterization many times.

Gastrointestinal—No oppetite, no vomiting, no belching. Bowels are constipated, must take laxative.

Urinary system—No hematuria, no polyuria. Has retention.

Respiratory—No cough, no hemoptysis. Best weight before onset of present condition 140 pounds. Present weight about 100 pounds. No night sweats.

Circulatory—No palpitation. No edema of the lower extremities.

Nervous—See above. Cannot sleep on account of pain. No headache. No dizziness.

Genitalia—No leukorrhea at the present time.

Young white woman, rather pale and apparently in pain.

Chest—Musculature flabby, tendency to phthisical type of chest. Expansion fair. Chest resonant throughout. Normal breath sounds heard throughout. No rales.

Heart—No bulge. Apex beat visible in sixth interspace just outside the mid-clavicular line. 120 regular—fair tone—no murmurs.

7/10/23—Neurologcal Examination: Patient suddenly was seized with pain in lumbar region while carrying coal. This was six months ago. She had a cold at the same time. About a week after the first occurrence, she

began to lose feeling in soles of feet. When the pains "get her" she cannot walk at all. Sensation of cold in legs very marked.

Patient is a poorly nourished woman. Pupils are regular and equal. React to light with limited slow excursion. Accommodation, consensual, and sympathetic reactions, good. Ocular movements normal except for slight Von Graefe. Right fundus slightly pale. Tongue in mid-line—no tremors. Ears and nose, negative. Thyroid, large and full, especially the right lobe. No tremor of hands. All deep reflexes in both arms decreased. Abdominal reflexes present. Lower extremities—Can raise legs from the bed. There is perspiration of legs, and yet they are cold. Both K.J.'s absent. Left achilles jerk absent. Right achilles reacts very poorly. No response on taking Babinski. Moderate toe drop—bilateral. On inspection, lumbar area on right side looks pretty full. Patient holds back rigid. Pain in both sides of lumbar region. Tenderness to percussion from twelfth dorsal all through lumbar region. In third, fourth and fifth sacral distribution, patient has sensation. First and second sacral, and fifth and fourth lumbar are most involved. Deep joint sensibility somewhat impaired in right leg. Vibratory sense impaired over lumbar region. She has slight difficulty in determining heat sensation only on dorsi of feet, otherwise temperature sensation is good. Sensation to touch is fairly good. Atrophy of right gluteal region and muscles of both legs.

The diagnosis was not at first apparent, and further study was considered essential. X-ray examination and spinal fluid studies were suggested.

7/14/23—For the last two days, there appeared a rash which was more marked on left leg than on right. Vibratory sense impaired up to ninth dorsal vertebra. Touch is somewhat interfered with in left leg. Both anteriorly and posteriorly, there is slight hyperesthetic area, commencing three fingerbreadths above umbilicus. Hypesthesia up to this area. Posteriorly area of hyperesthesia commences about twelfth dorsal, up to which there is hypesthesia. Can perceive difference between hot and cold but there is some impairment of temperature sensation in right lower limb in lumbar and sacral distribution.

Diagnosis—There seems to be evidence of obstruction about ninth and tenth dorsal. Tumor evidently situated in right lateral side of cord or in anterior part pressing the anterior horns.

7/15/23—The sensory findings are still unreliable, but one thing is certain and that is that the level in the anterior part of the abdomen is the same as the day before. Has had continentia urea for about one week.

7/16/23—There is pain in both sciatics along their course and the left is more painful than right. There is certainly no anesthesia in the sacral distribution.

Diagnosis—Most likely giant tumor of the cauda equina. The other possibility is tumor of the lumbar enlargement.

7/19/23—Operation by Dr. Landon—Laminectomy: Laminae of first second and third lumbar vertebrae removed exposing underlying dura. External appearance of dura normal but tense and unyielding in the lower two-thirds of the wound. Dura was opened when irregular infiltrating dark vascular growth was revealed. This involved the lower end of cord on left side and the upper part of the cauda equina. The roots of the cauda equina were compressed toward the right but were extensively involved. Tumor par-

tially encapsulated and adherent to the inner surface of dura and was irremovable. Specimen removed for examination.

7/20/23—Patient states, that as soon as she came out of the anesthetic, she felt her legs warmer and is fairly comfortable with two sheets, while for the last six months she required blankets and hot water bottles to keep her warm. Patient seems to be able to move her toes. Toe drop on left foot not nearly as marked as it was.

FIGURE 3. Photograph from drawing made at operation. Note tumor filling entire space and cauda equina sweeping toward right side.

7/29/23—There is a great deal more motor power in both legs, especially in right leg.

8/2/23—Patient can lift legs and move toes better than she could one week after operation. Legs are not so cold. The itching sensation is gone. Patient can turn her body in bed. When she turns herself now, her only pain is a slight one in her right knee. Her legs have nearly normal sensation now, no feeling of pins and needles. Below ankles it feels as if there were a turniquet around her legs. Patient ate with an appetite for the first time this A.M. Her general condition is much improved.

8/11/23—Deep ulceration over right side, upper end of gluteal cleft; painless, appears to be of trophic origin, but is not quite an ulcus decubitus.

8/15/23—The K.J.'s are much better, right especially is practically normal. Sensation in outer part of right foot is returning but the patient describes it as a strange sensation. Sensation in left foot more normal. Skin feels warmer in both legs. Still requires catheterization.

8/16/23—For the first time in six weeks patient voided urine, not requiring catheterization.

9/2/23—The legs seem to have filled out considerably although there is still some slight atrophy on the right. K.J. on the right is somewhat increased; left is normal. Achilles slightly increased on right, left normal. No Babinski. No evidence of toe drop on left, slight evidence of it on right. Can raise toes and feet very well. Evidently no sensory disturbances to pinprick in either foot. Vibratory sense intact. Patient complains of paresthesia in sole of right foot and outer part of right foreleg. Gluteal muscles on right have filled out somewhat but there is still evidence of atrophy.

9/3/23—Temperature normal for past three weeks. Up in chair daily, gets out of bed by herself. Seems much more cheerful. Ulcus decubitus has healed. Appetite good.

9/21/23—The patient was given deep X-ray treatment yesterday. Vomited last night. Feels weak to-day.

9/23/23—K.J.'s and right achilles moderately increased, left achilles slightly diminished. The atrophy of both legs has practically disappeared. The gluteal muscles on the right which were much atrophied are greatly improved.

Clinical Pathological Report: Tissue from spinal cord. By Dr. Andrews.

Specimen consists of several pieces of blood clot with minute pieces of greyish tissue. Microscopical section shows a peculiar picture. The stromal tissue consists apparently of fibrinous tissue in which are enmeshed a large amount of free blood and some new formed blood vessels. Some of the vessels are older and have a deep pink staining, hyaline wall in appearance. Some of the blood vessels have a lining of cells, others do not.

Scattered through it and apparently using it as ground work upon which to develop, there are many deep staining oval cells. In places this can be shown as stellate cells but for the most part they seem to be simply dark staining nuclei resting in the other tissue.

Diagnosis—Hemorrhage. Glioma of cord(?)

Spinal fluid examination: 7/13/23—Globulin heavy, fluid clotted, yellow color, few red cells and no whites in clot, granular debris.

7/14/23—Smear negative for T.B. Guinea pig injected.

8/3/23—Guinea pig died (peritonitis) negative for T.B.

7/10/23—Blood Wassermann negative.

Blood examination, red cells 4,200,000. Hemoglobin 80 per cent, W.B.C. 5,200. Urine examination 7/10/23. Albumen trace, few hyaline casts. A catheterized specimen on same day was negative.

8/7/23—Urine examination, albumen faint trace, W.B.C. 75 to 100 hpf.

7/23/23—X-ray report. No evidence of pathology in lumbar region.

1/15/25—Reëxamination. Patient feels well in every respect. Gait normal. Becomes exhausted when she works hard. K.J.'s and achilles are increased. Right K.J. slightly more than others. No Babinski or ankle

clonus. No sensory disturbances. Legs well developed. No sign of paralysis of toes.

Case Summary—The comparatively long duration of symptoms in this case, and the very successful outcome of it in spite of the fact that the tumor was found to be irremovable at operation, makes this a very significant case worthy of detailed study.

The outstanding and most significant symptom from the standpoint of diagnosis was undoubtedly the characteristic pain which she described very graphically. .

Practically all authors emphasize this feature of the characteristic pain in tumors of the cauda equina. Parker (14) in his report of tumor in this region states that five of his eight patients had slept sitting up in a chair for months. Elsberg (2) considers pain in the lower part of the back as one of the earliest and most continuous symptoms of the large intradural tumors of the lumbo-sacral parts of the cord and of the roots of the cauda equina. Wallgren (15) in his article on Pain in Cauda Equina Tumors, says that Volhard is the only one who described a case of caudal tumor altogether painless. In all other cases described, pain plays the dominant rôle, and that pain is in these tumors the most important and usually the first symptom, and stresses the fact that it is much worse in the recumbent position. Hertle reports a similar condition. Redlich (16) also reports that one of his patients with tumor of the cauda equina could no more lie down and had to spend his nights sitting up.

This patient's pain certainly conformed to this classical description. For about six months she did not lie down. She slept in her wheel chair. During part of the examination when she was required to stay in the recumbent position, she would scream with pain. While I would not advocate it as a pathognomonic sign or to make a diagnosis of cauda equina tumor on it alone, I do feel that pain of such a nature should make one suspect this condition very strongly, and in the presence of any other corroborative symptoms, even though but slight ones, a positive diagnosis may be ventured.

The next most distressing symptom from the patient's point of view, was the vasomotor disturbance. The patient's legs were perspiring markedly, but she felt very cold. During the hot days of July, she had them covered with woolen blankets and surrounded with hot water bottles, but none of these measures gave her relief. The first thing she noticed, after coming out of the anesthetic, was that her legs felt warmer. The effect of decompression alone was sufficient to restore this function.

None of the authors speak of this symptom as characteristic,

and in fact do not even mention it as present in their cases. Winkelman (17) of Philadelphia thinks this symptom common in peripheral nerve involvement, and ascribes this finding to the pressure of the tumor on the cauda equina. The symptom was so distressing to the patient that I consider it significant and it should be looked for in every case of this kind.

The atrophy of various muscles, perineal palsies, and the flaccid syndrome in general can, of course, be easily explained on account of the tumor pressure being exerted on the nerves after they emerge from the cord. Parker (14) stresses this finding as characteristic in this condition.

The paucity of the sensory findings and especially the lack of the typical saddle-anesthesia were rather confusing.

What further tended to confuse me for a while was the finding of hypesthesia higher up, and above that an area of hyperesthesia. It is for this reason that the localization of the tumor at about the tenth dorsal was kept in mind. It would not be amiss to point out, that the sensory findings of the first and perhaps second examination are of questionable value. It takes the patient some time to learn just exactly what is required of him and to be able to differentiate between normal and diminished sensation. Another factor is, no doubt, the patient's state of mind. He is worried about his condition to begin with, and the painstaking sensory examination both excites and frightens him.

Tenderness to percussion is very common in this condition and was very marked in this patient over the entire lumbar spine.

The spinal fluid findings in this case were of considerable help in diagnosis. It is well known that xanthochromia is very often found in this condition. Cushing and Ayer (18) wrote an article dealing with this question. It cannot, however, be said that this is of absolute value, since this finding is apt to occur in so many other conditions. DeSanctis (3) in his discussion of the Froin syndrome, refers to finding it in varied conditions "such as extramedullary tumors, even intramedullary tumors, and of meningeal tumors, and of the spine itself. These constitute about 50 per cent of the cases. In the other half are such varied conditions as the meningitides, namely, purulent cerebrospinal meningitis, meningococcus meningitis, T.B. meningitis, syphilitic meningitis, fibrinous hemorrhagic meningitis, Pott's disease, Landry's paralysis, as a result of trauma of the spine and lately, in spondylitis rhyzomelique."

What is to me of greatest significance in this case is the question of therapy. The tumor as can be seen from the illustration (see

Fig. 3) was very large and the caudal nerves were coursing over it and looked to be closely interwoven. The removal of the tumor was beyond question. While the pathologic diagnosis is not specific, yet I feel that it was of rather a malignant nature. Be that as it may, it caused much distress to the patient and greatly incapacitated her. Yet, the patient is alive to-day, a year and a half after the operation, and as can be seen from the reëxamination, she is perfectly well and without a trace of the previous symptoms.

In my opinion, it would not be correct to ascribe this result to the effect of the decompression. Surely at this late day the tumor would invade the cord and cause further disturbance. It is far more reasonable to assume that it is the deep X-ray therapy that brought this result about. It is only after deep therapy was instituted that major improvement set in. I, therefore, lay great stress on the value of deep X-ray therapy in inoperable tumors. This is of even more value because it can be used in such conditions as inoperable sarcomas. Sarcomas, as is well known, are more vulnerable to the X-ray than any other type of malignant tumor, and it is my belief that a patient suffering from such a condition should be given his chance with this treatment.

This point deserves such emphasis, because as recent as January, 1925, Dandy (7) practically starts his article on spinal cord tumors with the statement: "Although the only possibility of a cure to patients so affected is by total removal of the neoplasm, defects in the method of diagnosis and localization have until recently withheld from many the fruits of operative procedures." Again in his summary and conclusion, he makes the statement: " There is but one treatment for spinal cord tumors—removal by operation." True, in the body of the paper he cites an inoperable case that was treated successfully with radium, but he further mentions that he used this in all the other inoperable cases, and in two cases he used deep X-ray treatment but he found this of no great help.

It may be contended that this successful result of mine is only in one case, and, therefore, not of such significance. This objection would hold good, but there are many successful cases reported by now, especially in the German literature, which tend to show the great benefit to be derived from this form of therapy. Fischer (19) cites a patient of Saenger's, way back in 1917, in whom an inoperable tumor in the upper dorsal region was found. The tumor had extended into the cord, and only the extramedullary portion could be removed. She was afterwards treated systematically with X-rays. I presume that this was before the time of deep X-ray therapy. After two years,

she was cured and remained with mild residual symptoms, so that she was again able to work as a servant girl.

Fischer himself reports the results of X-ray treatment in four cases, and about his fourth case which he considers a brilliant result he says: "The raying, which was directed to only one area, and its effect, the complete disappearance of all symptoms, shows with equal certainty, equally as well as a successful operation, that the tumor was at this level, and that only a tumor was there." He thinks it was a sarcoma of the meninges. Again he says: "The X-ray treatment was followed by a complete cure from the clinical standpoint. Had the patient been operated upon it would have been, without doubt, talked about as an excellent result." In a footnote, he reports two more cases, in one of which the result was equally as brilliant, and in the other there was marked improvement.

He studied very carefully the effects of the rays on the tumor and the spinal fluid. In this connection, he says: "We see in the spinal fluid changes the first manifestation of the destroying effect of the X-ray, the beginning necrosis of the tumor. Clinically also the effect of the rays on the tumor manifests itself in definite symptoms. Following the raying, there is a pronounced aggravation of symptoms, in that the spastic paresis turns into paraplegia; the sensory and urinary disturbances become worse, so that the clinical picture is that of a transverse myelitis. This aggravation of symptoms is at any rate the expression of a marked swelling of the tumor as a result of the X-ray treatment."

"Of special importance is the observation that both cases promptly and regularly within less than twenty-four hours following the treatment developed decubitus."

Wyss,(20) in 1915, reports a case of gliosarcoma situated subdurally which was removed and followed with X-ray therapy. The result was fairly good. Rand (4) has given deep X-ray therapy following the operation for fibrosarcoma. The patient was well after two years.

In view of the above cited cases, I think it extremely hazardous to state at this late day that operation is the only procedure that affords the patient a chance for cure. It is my firm belief that every patient who has an irremovable cord tumor—and this can after all only be established by operation—should be given the benefit of deep X-ray therapy.

The report of Dr. J. F. McCollough, the roentgenologist, as to the amount of treatment is as follows: "The factors used were 190 K.V., .5 mm. of copper filter, 1 mm. of al. filter, 60 cm. a dis-

tance, 4 ma., 140 minutes. One port of entry, size 15 x 20 cm. This was given in four sessions.

Case 6. Miss M. L., age thirty-seven. Hos. No. 4203. Date of Admis. 11/17/24.

C.C.—Difficulty in walking. Numbness of toes. Jerking and jumping of muscles of legs.

F.H.—Father died of T.B., mother living and well. Two brothers and two sisters living and well. One brother died in infancy.

P.H.—Childhood diseases only. Has always been well. No injuries, no operation.

Analysis of C.C.—About six weeks ago, patient began to have pains around her waist. They seemed to come on at night after she retired, or when she was tired. About a week later, she began to notice she had some difficulty in walking; she was not sure of herself—stumbling. Then she noticed numbness in both feet. She became progressively worse, and finally, last Thursday (five days before), her legs were so weak that she was unable to stand and had to go to bed. She feels her muscles jumping at times, especially those of calves of legs. Has had no pain in legs. She has not felt the pain around her waist for about a week, but she feels that she has a lot of gas on her stomach. She has no sensation in toes, but does have it in her legs. She has been unable to void since Saturday (three days before). She feels the desire to void, but cannot do so.

Has had no headache, no visual disturbance. Appetite fair. Sleeps well. No menstrual disturbances.

Patient has worked in store, and she stood on her feet for about seven hours per day.

11/21/24—Neurological examination.

The first thing she noticed was pain in the stomach about six weeks ago, the pain radiated upwards on the left. Pain was aggravated by coughing or sneezing. It would come and go. About two weeks ago, she noticed numbness of toes of both feet which was fleeting in character. Soon after this—about one day later—she noticed difficulty in walking, unsteadiness in gait, but kept on feet for about a week longer. For a few days she walked by holding on to things.

About two years ago, felt pain in right thigh which lasted for about a week. Did not consult a physician, but she herself called it "neuritis."

Physical examination—Pupils normal. At first glance there seems to be evidence of facial palsy, but on closer examination it was found not to be so. No pharyngeal palsy. Tongue somewhat tremulous, slightly perceptible tremor of hands. Grip of hands is good. Deep reflexes of arms normal. Abdominal reflexes absent, except under left which is slightly present. There is absolutely no movement of either lower extremity. Apparent inequality of size of legs. Right is one-quarter inch less than left. K.J.'s are increased, slightly more on right. Crossed K.J. reflex present, both right and left, but more pronounced left to right. Achilles increased both sides, but more on left. Definite ankle clonus on both left and right, but more on right. No patellar clonus. Chaddock, Babinski and Oppenheim positive on both sides, but more marked on left. Gordon positive on left only.

Analgesia present on right side anteriorly up to tenth dorsal distribution,

and posteriorly up to twelfth dorsal. Hypesthesia up to fifth dorsal distribution anteriorly, and about sixth dorsal distribution posteriorly. On left side there was hypesthesia of leg and extending on trunk up to about seventh dorsal distribution. Thermohypesthesia was present on right up to about eighth dorsal distribution anteriorly and sixth dorsal posteriorly. On left the foot only was involved. There seems to be anesthesia on trunk anteriorly,

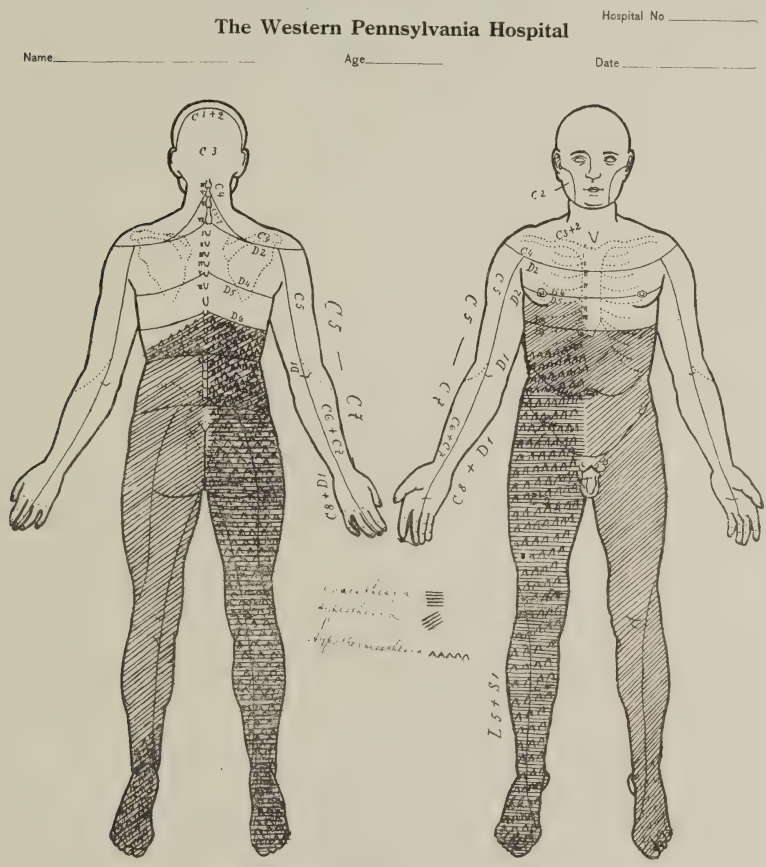


CHART 1.

more marked than on left leg. There was a suggestion of gibbus at eighth and ninth dorsal vertebrae. No tenderness on percussion of spine. Vibratory sense diminished on right side. She did not detect small movement of toes, but she could detect large movements of feet. Evidence of moderate Brown-Sequard syndrome.

Diagnosis—Neoplasm, probably situated in mid-dorsal region about fourth, fifth and sixth dorsal segments, and on left lateral side of cord, most likely posteriorward, but differentiation between extra- and intramedullary tumor cannot be made with absolute certainty as yet. Will require further study of sensory disturbance.

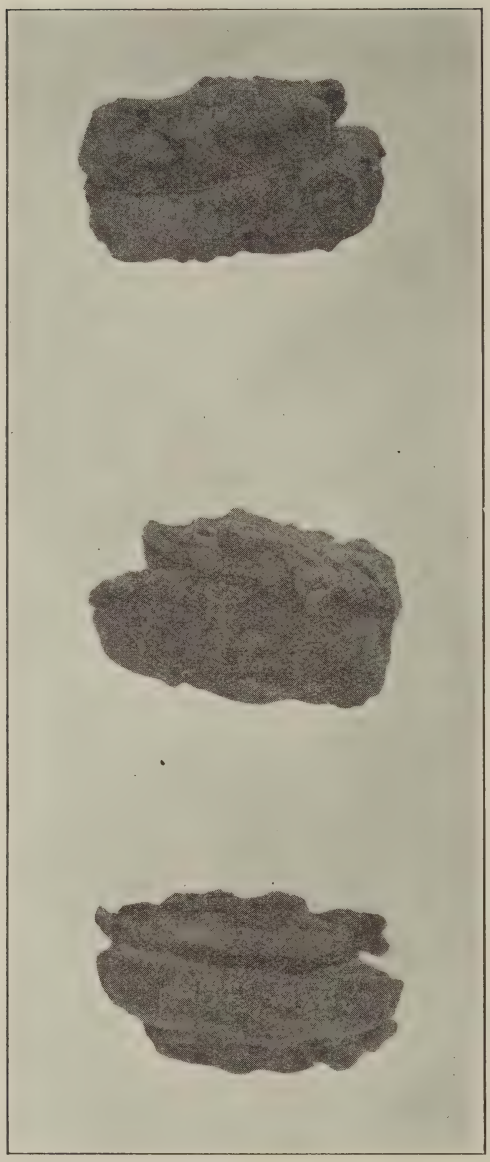


FIGURE 4. Three views of upper-inferior view, middle-superior view, lower-side view.

11/22/24—Pilocarpine gr. ⅛ injected at 1:35 P.M. to determine vasomotor disturbance. The nurse reports sweating down to a line one and a half inches above umbilicus.

Hypesthesia extends up to about one inch below the nipple on the right, and three fingerbreadths below on the left.

11/23/24—Neurological findings are the same as previously reported.

Diagnosis of tumor of the cord is the most likely.

Operation is advisable—covering third, fourth and fifth dorsal segments. Tumor on left?

Patient operated on 11/24/24, by Dr. Landon.

Spinal canal opened by removal of second, third and fourth thoracic vertebrae. Opposite third vertebra the dura was tense and a nodular tumor could be felt beneath; pulsation was present above this level and absent below. On opening the dura, a tumor springing from posterior surface of the dura, saddle shape over the cord compressing the cord, was found. Antero-posteriorly, the cord was thin and flat. The tumor was not attached to the cord, and was excised from the dura. Grossly, the tumor had the appearance of a fibrous growth, probably endothelioma. From the appearance of the cord, it was felt that compression had reached a degree incompatible with functional recovery.

11/25/24—Sensation has returned to feet and lower part of legs more than elsewhere. Experiences pain sensation in her left foot very well, on right it is somewhat diminished. Thighs and lower abdomen are the same as before operation. K.J. on left about normal, on right diminished. Reflex spasms pronounced on both sides. Deep joint sensibility in left big toe lost, on right vague. Patient is in fairly good condition.

11/26/24—Patient can control her urine and bowel movements. The sensation is improved in that she feels pin prick in the right leg and foot and can differentiate definitely between the head and the point of a pin. Heat sensation is still interfered with on right. She calls both cold and hot—hot, but before operation she could feel neither cold nor heat in the right leg and foot.

11/28/24—Both K.J.'s about normal, right achilles slightly increased, left achilles much increased—clonic in response. Right ankle clonus exhaustible—three to four jerks, left more pronounced. Babinski, however, more pronounced on right, suggestive on left. Chaddock on both sides, Gordon on right. No Oppenheim.

Sensation—Pin prick much plainer on left than on right in the legs. On abdomen still spotty, felt in certain areas and not in others. Hypesthesia still present up to same level as before operation, though not so marked. Abdominal reflexes still absent. Deep joint sensibility of toes still vague. Movements of entire foot can be well differentiated. Vibratory sensibility still diminished in legs.

11/30/24—Note by Dr. Wholey. Better control of bladder and bowels when awake. Cathartic causes loss of control of bowels.

12/7/24—Spasm reflexes of both legs fairly marked, and patient's legs are partially drawn up in flexion. Ankle clonus and Babinski marked, more than before. Very faint abdominal reflexes present. These appeared for the first time yesterday.

12/8/24—Examination of chest. No definite areas of diminished resonance. Breath sounds are somewhat harsher than normal. In lower part of left axillary region, fine crepitations are heard. In same area of right side, fine moist rales were heard, and also at right base posteriorly.

12/11/24—Toes of both feet twitched once—on voluntary effort. There seems to be oversensitiveness on touch, taking Babinski, or abdominals. Babinski same. Ankle clonus same, marked on both sides. K.J.'s moderately increased. Feels pin prick but hypesthesia of both feet still present.

12/16/24—Wound practically open, very little drainage. Acriflavine 1 to 1000 has done remarkably well. Patient is quiet, comfortable, and relatively afebrile. Little change in the peripheral neuromuscular system. Mental condition better. Patient is brighter.

12/24/24—Up in chair now. Wound cleaning up very well. Practically healed. Temperature now down. Patient quiet and comfortable. No change in peripheral nerve condition.

12/28/24—Patient states that for the last three days she has been able to control her urine. On making strenuous efforts, the patient moves the toes of her left foot. On testing for pain, she finds the sensation extremely unpleasant.

1/2/25—Patient is able to move both feet. There seems to be also some movement in the thighs. Can rotate both legs inward. Ankle clonus still present, but exhaustible. Babinski and concomitant signs as marked as ever. Sensory functions same as previously reported.

1/5/25—For the last two days, patient is incontinent again. Movements of the right foot are less than at the last examination. There is fair movement of the left foot and leg.

1/7/25—Movement present in both legs and feet.

2/20/25—For the last two weeks she has been able to pull up her legs in bed. To-day for the first time she can raise her right leg from the bed about two inches, but the one effort exhausts her and she cannot repeat the action. Reflexes are about normal. Babinski and ankle clonus practically disappeared. Sensory functions about normal. Has control of sphincters.

2/27/25—Left abdominal reflexes present but diminished. Right abdominals cannot be obtained. Patient has raised right foot about eight inches from bed. She can pull up left leg but cannot lift it. K.J.'s about normal. Achilles increased. Ankle clonus on both sides, but exhaustible—few jerks. Babinski on right still present, on left cannot be obtained. Pin prick is felt all over. Deep joint sensibility normal—can detect movements of toes. Tactile sensation intact.

Urine examined several times. At one time showed evidence of marked cystitis.

1/17/25—Urine fairly normal.

11/18/24—Spinal fluid. Wassermann, positive ++. Cells 10, 80 per cent lymphocytes. Globulin strongly positive. Pressure less than normal. Fluid clear yellow tint, xanthochromia. Colloid gold 1255555540.

11/22/24—X-ray. There is no evidence of fracture in the dorsal spine.

11/17/24—Blood Wassermann, negative. Guinea pig injected for T.B., negative.

12/2/24—Blood culture, staphylococcus positive.

Temperature before operation rose to 102 2/5 on 11/23/24. On November 28, 1924, four days after operation, there was a sudden rise to 103 1/5, and for two weeks was very stormy. The incision was infected and she had a fairly severe staphylococcus septicemia. Then quieted down for about ten days, and there was again a period of elevation of temperature.

Pathological Report—Tissue—Tumor of spinal cord. S.P. No. 23029.

Remarks—Specimen is a tumor growth measuring 3 x 1¾ cm. Its outer surface is convex and somewhat rough where it has been attached, apparently to fibrous tissue. The inner surface is concave producing a troughlike effect. Each half of the trough measures ¾ cm. The tumor has a greyish-pink color, rather firm, as a hard boiled egg. Tumor is slightly lobulated, apparently encapsulated except for its attachment. Cut surface produces a greyish cellular appearance.

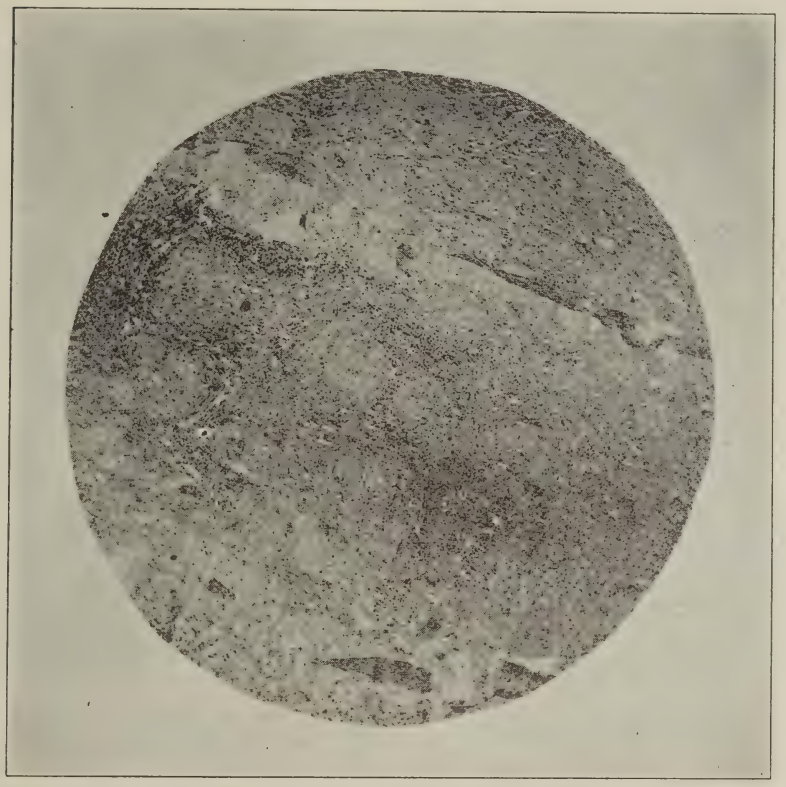


FIGURE 5. Microscopic picture of tuberculoma, low magnification. Note giant cells and typical tubercle formation.

Microscopic section of the nodule shows a very cellular structure with fibrous tissue strands running through it with some small areas of necrosis. Typical tubercle formation is very common with epithelioid cells, giant cells, and round cell infiltration. Near the surface, blood vessels are common, showing considerable congestion; vessel walls are quite thin. The granulomatous growth is apparently developed beneath the endothelial lining elevating it and producing a thickening in places which is shown by polyhedral cell formation in many places. Most of the giant cells are very large, contain many nuclei, and much protoplasm.

Diagnosis—Tuberculoma apparently originating from dura mater of cord. Dr. Andrews.

Case Summary—This case presented many difficulties in diagnosis. The development of symptoms followed one another with lightning rapidity. It is on account of this state of affairs that tumor had to be considered with caution. Two other conditions had to be given serious consideration, namely, myelitis and lues, especially so because of the presence of temperature and a moderately positive

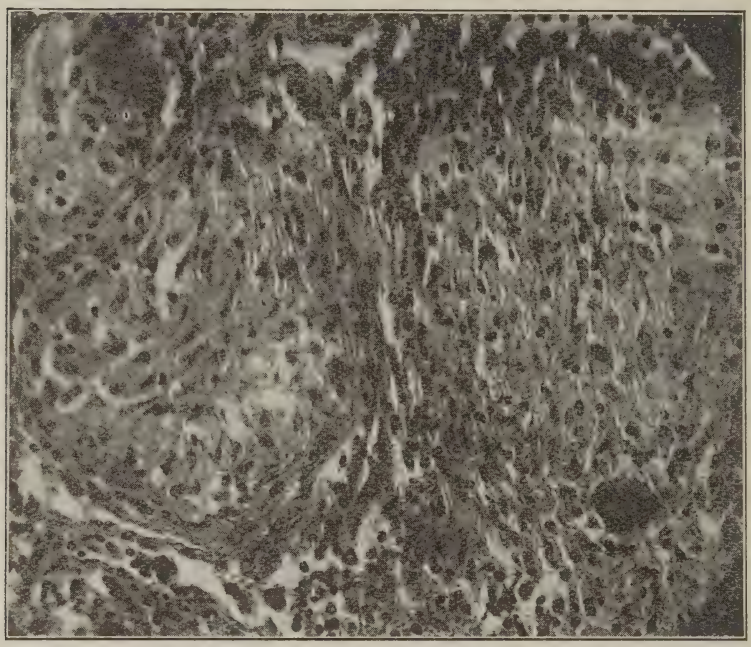


FIGURE 6. Two tubercles—high power magnification.

Wassermann in the spinal fluid and the pronounced colloidal gold curve. On careful consideration of the symptoms and the order in which they appeared, it was seen that it was the story of a tumor enacted in miniature and the grand finale—compression syndrome—arrived at quickly.

Wassermann of the spinal fluid occasionally does occur in tumors of the cord. Ehrenberg (8) and Rand (4) both report cases of cord tumors with Wassermann positive fluids. In this case I disregarded the positive Wassermann in the fluid and ruled in favor of tumor.

The temperature, usually slight, but at one time before operation

as high as 102.4, gave me considerable concern. Myelitis was finally ruled out because of the slowness of development of symptoms and the kind of sensory changes present. At the time of examination, I thought the temperature could be explained by the presence of a mild cystitis. From the operative findings I am convinced, however, that the growth, inflammatory in character, was the main cause of the temperature.

How much value could we attach to root pains in this case, and were they real root pains? She started out with the complaint of pains around the waist, truly of a segmental distribution. But does the fairly rapid disappearance of this symptom argue against tumor? Evidently not. There are quite a few cases reported with pains of this character, either showing remission or disappearing altogether. Stewart,(12) discussing this subject, emphasizes this point strongly.

The history of " neuritis " given by the patient as having occurred two years before, strengthened my belief before the operation that it was a tumor I was dealing with, but after finding the nature of the growth, I was convinced that this was a mere incident and had no relation whatever to the present condition.

Many attempts have been made to generalize as to the localization of the tumor in relation to the cord, such as lateral, anterior, etc. While, theoretically this sounds well and it would be of great help clinically if we were able to do so, we find that practically it cannot be done. Adson and Ott (21) state: " Tumors pressing the cord dorsally cause sensory disturbances before motor; those situated laterally or anteriorly are more likely to produce Brown-Séquard's syndrome with motor disturbances before sensory." Abrahamson and Grossman (13) also lay stress on this feature, and state particularly that posterior pressure causes disturbance in the deep joint sensibility fibers. This case does not seem to conform to any of these rules. Of course, it may be due to the extremely rapid progress of the case. A study of the sensory chart will quickly reveal that pain and temperature are mostly involved, touch very much less, and but slight involvement of the deep joint sensibility, with the exception of vibratory sense. And yet the tumor was situated posteriorly and pressed directly on the posterior columns before invading the lateral portions of the cord.

The presence of a fairly marked Brown-Séquard syndrome inclined me to the belief that the tumor was on the left dorsolateral side. This was substantiated only in that much, that the tumor on the left side had progressed somewhat more than on the right side.

Even the interpretation of a Brown-Séquard syndrome is open

to the same objection, and many authors point out that it may occur in intramedullary tumors. Fleck,(11) in discussing this point, arrives at the same opinion and cites such authorities as Oppenheim, Karger, Veraguth and Brown, who hold the same view.

While we cannot say with absolute certainty that there is no other focus of T.B. in this patient (especially taking in consideration that her father died with T.B.), we could not find any other focus of infection elsewhere in the body.

The site of the lesion—intradural tuberculoma is extremely rare. True, almost every textbook mentions it as a possible site, yet a careful search of the literature fails to reveal even a few cases. Redlich (16) refers to a case reported by Pelz of pachymeningitis tuberculous externa which assumed the clinical picture of a tumor. Gowers (22) says: "The tumors which begin with the duramatral sheath are chiefly syphilomata, carcinomata and myxomata, sometimes containing cysts or 'brain sand.' Tubercular and parasite tumors are rare." Hunter,(23) in reporting a case of tubercular tumor of the spinal cord in a child of two years, states that tubercular nodules of the cord unassociated with tubercular nodules in other parts of the nervous system are very rare, or, at least, very few such cases have been put on record. Müller (24) reports a case of solitary tubercle of the cord which developed in five weeks, and cites a case by Dinkler (evidently in the eleventh volume of Deutsche Ztschr. f. Nervenh.) that developed a solitary tubercle as a result of tuberculosis of the dura around the third pair of nerves (cervical). Adami and Nichols (25) state: "Tuberculosis of the dura is almost invariably secondary to Pott's disease of the spine, less commonly to tuberculosis of the pia-arachnoid and cord." Collier,(26) in his chapter on spinal cord tumors in Oxford Medicine, does not even mention solitary tubercle of the meninges, and only refers to solitary tubercles of the cord itself. Beckman,(27) in a report of eighteen cases of tumor, speaks of a case of tuberculoma "situated on the anterior surface of the dura and pressing backward on the cord. It had not, however, involved the structure of the dura." Frazier,(28) in a series of 320 cases of cord tumor collected by Steinke, mentions eight cases of tuberculoma, and in the discussion, he says: "Solitary tubercles have been most frequently found in the center of the cord"; and again, "They (tuberculomas) may also arise in the dura mater compressing the cord." He himself reports the case of a patient with pulmonary T.B. who exhibited cord tumor symptoms. At operation no extramedullary tumor was found, and he made the diagnosis of intramedullary tuberculoma. Dandy (7) mentions in his table 1

two cases of tuberculoma, one intramedullary and one extradural. This last followed a trauma and evidently did not involve the dura. As can be seen from among all the cases that I reviewed I could find but one case of a similar nature, that by Pelz. Unfortunately, I could not secure the original article.

The spinal fluid findings, aside from the positive Wassermann, was fairly characteristic. It was xanthochromic, and with the history of rapid compression it certainly pointed toward the diagnosis of tumor.

The question of therapy in this case even after the successful removal of the tumor is of quite some importance and also of some concern. On account of the positive Wassermann reaction in the fluid and the colloidal gold curve, I would perhaps be inclined to try anti-luetic therapy, but the presence of T.B. definitely precludes the use of iodine for fear of precipitating a new tubercular process. The fairly good progress of the case as is evidenced by the complete alleviation of the sensory changes and gradual return of motor power is another reason for not attempting any other form of therapy for the time being.

The post-operative infection and staphylococcus septicemia were rather unfortunate for the patient, and yet perhaps it was a blessing in disguise. With malaria treatment for lues and fixation abscess in encephalitis, it may well be that a high fever resultant from the septicemia may have helped this tubercular patient.

Summary

After studying these cases carefully, one is impressed with the correctness of the statement that diagnosis and especially exact localization is difficult, and for the following reasons: First, while there is a frequent chain of symptoms following one another in logical sequence, there are so many exceptions that a fast and definite rule cannot be established. Starr's (29) (quoted by Steinke) formula of sequence of symptoms is about as good as any: "(1) peculiar pains limited in distribution; (2) increase of reflexes below the lesion; (3) paraplegia; (4) loss of sensibility, and (5) loss of all subjacent reflexes. The sequence of symptoms is very important for the diagnosis and correct valuation of the symptoms of spinal disease." Abrahamson and Climenko (9) gave a carefully elaborated scheme of sequence of symptoms, with the result that during the discussion that followed, Dr. Climenko who read the paper was besieged by objectors on all sides. Thus Grinker (30) says: "I have seen cases of extramyeline tumor without pain, and I am sure every

one has, at least, not early, when we expect neuralgiform pains. On the other hand, I have seen cases of intramedullary tumor in which there was pain." Adson (31) says: "I have seen quite a number of spinal cord tumors, and have found that one rarely finds the textbook picture."

While speaking about pain, this symptom has been considered one of the most constant ones, and yet it may be absent. Oppenheim and Borchardt (32) stress this point, while Clymer, Mixter and Mella, (33) although considering it as most frequent, admit that it is not universal even in cord tumors.

Practically the same exceptions could be cited in connection with every other symptom that is common in this condition.

Secondly, the many possible sites of lesion in this very long tube, and added to that, that we include under this term the meninges as well as the vertebral column, makes uniformity of symptoms almost impossible. Especially, when we stop to consider the delicate slender cord packed as it is with so many important fiber tracts, ganglionic cells, and blood vessels, it can be readily understood that it is next to impossible to figure out just exactly into what direction the pressure of a particular tumor is exerted. Case 6 illustrates this point very well. The tumor was situated saddlelike over the posterior surface of the cord, and yet deep joint sensibility was but slightly involved. A careful inspection of the tumor to my mind explains the reason. The under surface of the tumor is ridged, due to configuration of the cord, to be sure, and therefore probably elevated sufficiently to lessen pressure on the posterior column, whereas, when the tumor commenced to grow laterally, it exerted its full pressure on the spinothalamic as well as pyramidal tracts.

Still another reason, as was pointed out before, is the fact that so many possible sites occur. In this small series, the four tumors that were verified represent all the various tissues that are included under the heading of cord tumors.

The comparative rarity of the cases, except in large centers, is another factor. Williamson (1) truly says: "The cases are rare." DeSanctis (3) also stresses the same point. He says: "Let us not leave it unmentioned that cord tumors are comparatively rare conditions."

It is because of these reasons that each case should be given careful study and considered individually. There are no short-cuts to diagnosis in these cases. They require intensive, careful, and intelligent study.

Every author stresses a careful history. An effort should be

made to analyze the symptoms, determine, if possible, the sequence of events, evaluate each symptom of the particular patient concerned. Sensory studies are to be made extremely carefully. Again, I would like to stress that at least in the majority of cases, the results obtained from the first two examinations are of little value. The patient himself has to learn what is expected of him. He must also be able to differentiate not only extremes of sensation, such as normal and complete anesthesia, but the various grades of sensation between these two extremes.

X-ray is of considerable help, more in a negative way. By it, we can rule out bone lesions. As to the newer methods, such as Dandy's air injection and Sicard's lipiodol injection methods, we have the word of Dandy (7) himself that they are indicated in about 10 per cent of cases only. He admits that in 90 per cent of cases a careful examination is adequate to make both a correct diagnosis and a precise localization. Since these mechanical aids are of help only in establishing the presence of complete or near complete block, it seems to me that even if they were negative, most observers would probably feel inclined to have an explanatory laminectomy performed. This is especially apt to be the case, since everybody agrees that an exploratory laminectomy carries no danger with it. Fleck (11) says: "The laminectomy as such is in the present development of operative technique, according to preponderant opinion, not dangerous to the life of the patient. Nonne especially stresses this point and insists on an exploratory laminectomy in all doubtful cases. Oppenheim gave expression to this even in 1907." The question of complete block or partial block is after all not of paramount importance, and one can conceive the presence of a large tumor especially of the soft variety, without there being any appreciable blocking. On the other hand, there may be adhesions causing block.

The spinal fluid is of considerable help in diagnosis. Aside from the grossly positive Froin syndrome, even minor changes such as slight globulin and mild increase of cells is of great help, especially if one accepts Petren's (34) view as regards cell count. He considers three cells as the upper limit of normal.

Of the six fluids, five were fairly pathological. Xanthochromia occurred in 50 per cent of the cases. Other changes were equally as frequent.

The rare condition of solitary tuberculoma of the dura again merely tends to emphasize the importance of careful study and the possibility of surprise in the best studied case.

The question of therapy is quite important. There is no doubt

that operation is indicated and the earlier the better. But, in that fairly important group of nonremovable tumors, deep X-ray therapy should be used in every case. This is especially indicated because of its being a harmless procedure. Were we able to diagnose beforehand an irremovable tumor with any degree of precision, I would urge this treatment to be used before operation, but in the present state of our knowledge, I must say that operative measures should be taken first, and then if indicated, deep X-ray therapy.

Conclusions

1. Diagnosis of cord tumors is difficult. Each case should be studied carefully and intensively.

2. All possible aids to help out in the diagnosis should be sought.

3. There are no absolute criteria to go by either in the diagnosis of tumor or in differentiation as to site of cord affected. Each case has to be studied by itself, and even then surprises are frequent.

4. In the present state of our knowledge, operation is indicated in practically all cases. Laminectomy is not a dangerous procedure, and is justified as an exploratory measure in doubtful cases.

5. Deep X-ray therapy is a valuable addition to our armamentarium in combating this disease.

REFERENCES

1. Williamson, R. T. A Case of Spinal Meningeal Tumor, the Practical Importance of Early Diagnosis. Clin. Jour., 1919, XLVIII, p. 147.
2. Elsberg, C. A. The Early Symptoms and the Diagnosis of Tumors of the Spinal Cord, with Remarks on the Surgical Treatment. Am. Jour. Med. Sc., 1923, CLXV, p. 720.
3. deSanctis. Klin. beitrag. zum Studiem der Rückenmarksgeschwülsten und der Froinschen syndrome in Liquor. Deutsch. Ztschr. f. Nervenh., 1923, LXXVI, p. 183.
4. Rand, C. W. Observations on Spinal Cord Tumors. Southwest. Med., 1923, VII, p. 105.
5. Stookey, Byron. A Study of Extradural Spinal Tumors. Am. Arch. Neur. and Psychiat., XII, p. 664.
6. Climenko, H. The Diagnosis of Spinal Cord Tumors. Med. Rec. N. Y., 1920, XCVII, p. 909.
7. Dandy, Walter E. The Diagnosis and Localization of Spinal Cord Tumors. Ann. Surg., Jan., 1925, LXXXI, No. 1, p. 223.
8. Ehrenberg, L. Zur Kasuistik der primären Tumoren der Cauda equina. Acta med. Scandin., 1923, LIX, p. 71.
9. Abrahamson and Climenko. Symptomatology of Spinal Cord Tumors. Jour. Am. Med. Assn., 1920, LXXV, p. 1127.
10. Bing, Robert. Compendium of Regional Diagnosis in Affections of the Brain and Spinal Cord. New York, 2d edit., p. 43.
11. Fleck, U. Zur Differential diagnose der extra- und intramedullaren Rückenmarkstumoren. Ztschr. f. d. ges. Neurol. u. Psychiat., 1922, LXXVI, p. 322.
12. Stewart, T. G. Some Observations on the Symptomatology of Spinal Tumors and Compression Paraplegia. Med. Press, 1922, N. S. CXIV, p. 306.

13. Abrahamson and Grossman. Tumors of the Upper Cervical Cord. Jour. Nerv. and Ment. Dis., LVII, April, 1923, p. 347.
14. Parker, H. L. The Diagnosis of Tumors of the Cauda Equina, Conus, and Epiconus, Medullaris; a Report of Nine Cases. Am. Jour. Med. Sc., 1922, CLXIII, p. 355.
15. Wallgren, A. Ueber Schmerzen bei Kaudatumoren. Deutsch. Ztschr. f. Nervenh., 1923, p. 107.
16. Redlich, E. Ueber diagnose und behandlung der Rückenmarksgeschwülste. Med. Klin., 1921, LVII, 1317.
17. Winkelman, N. W. Personal communication.
18. Cushing, H., and Ayer, J. B. Xanthochromia and Increased Protein in the Spinal Fluid Above Tumors of the Cauda Equina. Am. Arch. Neurol. and Psychiat., 1923, X, p. 167.
19. Fischer, O. Beitrag zur Pathologie und Therapie der Rückenmarkstumoren. Ztschr. f. d. ges. Neurol. u. Psychiat., 1922, LXXVI, p. 82.
20. Wyss, O. Ueber operative Heilung einer Falles von Gliosarkom des Halsmark.
21. Adson and Ott. Results of the Removal of Tumors of the Spinal Cord. Am. Arch. Neur. and Psychiat., 1922, VIII, p. 521.
22. Gowers, W. R. Diseases of the Nervous System. Blakiston, 1888, p. 409.
23. Hunter, W. K. Case of Tuberculous Tumor of the Spinal Cord in a Child Two Years Old. Brain, 1902, XXV, p. 234.
24. Müller, L. R. Ein weiterer Fall von solitarer Tuberculose des Rückenmarks, Zugleich ein Beitrag zur Lehre von der Brown-Séquardschen Halbseitenlähmung. Deutsch. Ztschr. f. Nervenh., 1898, XII, p. 288.
25. Adami and Nichols. Principles of Pathology. Lea and Febiger, 1911, p. 599.
26. Collier, J. The Oxford Medicine. 1921, VI, p. 462.
27. Beckman, E. H. Tumor of the Spinal Cord, with a Report of Eighteen Cases. Journal-Lancet, 1917, XXXVII, p. 37.
28. Frazier, Charles H. Survey of the Spine and Spinal Cord. Appleton, 1918, p. 514.
29. Starr. Quoted by Steinke. Jour. Nerv. and Ment. Dis., 47, June, 1918, p. 419.
30. Grinker, J. Jour. Am. Med. Assn., 75, p. 1131.
31. Adson, A. W. Jour. Am. Med. Assn., 75, p. 1132.
32. Oppenheim, H., and Borchardt, M. Weiterer Beitrag zur Erkennung und Behandlung der Rückenmarkgeschülste. Deutsch. Ztschr. f. Nervenh., 1918, LX, p. 19.
33. Clymer, G., Mixter, W. J., and Mella, H. Experience with Spinal Cord Tumors During the Past Ten Years. Am. Arch. Neurol. and Psychiat., 1921, p. 214.
34. Petrén and Petrén. Studien über Rückenmarkstumoren. Acta. med. Scandin., 1923, LIX, p. 622.

UNILATERAL ARGYLL-ROBERTSON PUPIL, WITH PRESENCE OF CONSENSUAL REACTION IN BOTH EYES. REPORT OF A CASE

By William C. Menninger, M.D.

TOPEKA, KANSAS

FROM THE SECOND MEDICAL (CORNELL) DIVISION, BELLEVUE HOSPITAL, NEW YORK CITY

The following case is of interest since it presents the unusual feature of a unilateral fixed pupil to direct light stimulation but with active consensual reflex present in both eyes.

M. B., aged forty-nine, female. Diagnosis: Acute sero-fibrinous pleurisy on left side. The patient was observed only during a relatively short stay in the hospital. She had been troubled with dizziness at times, and some time previously had had a period of incontinence. Primary lesion was negated. While in the hospital, she was slightly euphoric, and believed her memory was failing. There is no history of eye complaint or disease.

Eyes: The right pupil shows absolute fixation to direct light but reacts slightly on convergence and accommodation, and slightly on direct light stimulation in the left eye (consensual reaction). It is regular in contour and slightly smaller than the left pupil. The left pupil reacts to direct light stimulation promptly through nearly a normal arc, and holds well. It reacts to accommodation and convergence and to consensual reflex from the right eye. Its contour is regular. The visual fields of both eyes are roughly normal. Visual acuity is somewhat diminished in both eyes, requiring correction for reading. Extraocular motions are normal. There is no nystagmus or strabismus. The right disc shows slight nasal blurring but not sufficient to be included as neuritis. The left disc is normal.

Neurological (positive) findings: The tongue deviates slightly but persistently to the left. There is a slight speech defect on test phrases, but the patient has noted no change. Abdominal reflex, knee and ankle jerks are all present; the knee jerks are slightly exaggerated, and the ankle jerks slightly diminished. Babinski and Oppenheim signs are absent. Deep muscle pain sense is diminished. The serum Wassermann test is four plus; spinal fluid Wassermann test is negative. The colloidal gold curve on the spinal fluid reads 1222100000. The case is suggestive of early paretic neurosyphilis.

Discussion. The question of the essential characteristics of an Argyll-Robertson pupil will not be considered here. There is a variance of opinion which is discussed by Mehrtens and Barkan,(1) Dunn,(2) and many others, and may be consulted in textbooks on

ophthalmology and neurology. It is considered here in the terms of Wilson,(3) as a pupil in which there is an "absence (or obvious diminution) of the direct reflex to light, the consensual being either present or absent," with the preservation of the reaction on convergence-accommodation.

Unilateral reflex iridoplegia is not frequent, but is more frequently noted than formerly. Caspar(4) (1906) found only seven cases in 26,000 patients examined and only ten previously reported in the literature. In an effort to find the report of a case similar to the one presented, the writer has reviewed some thirty cases in the literature. Lutz (5) states that 3–4 per cent of all general paralytics showing pupillary fixation present unilateral Argyll-Robertson pupil and Mott (6) reports 3 per cent of 150 hospital and asylum cases of tabes showed this phenomenon.

However the occurrence of a unilateral reflex iridoplegia to direct light and the presence of the consensual reflex in both eyes is much less frequent. Lutz(5) presents a case and also a detailed discussion of the whole subject of light pupillary reflex. He reports five other similar observations from the literature: Babinski,(7) Berger,(8) Bechterew,(9) Jessop,(10) Piltz.(11) Wilson also touches on this feature in Argyll-Robertson cases. The writer has paid particular attention to pupillary reactions in general surgical and medical cases which were not primarily neurologic or ophthalmologic. In approximately one thousand such cases examined, the common form of unilateral Argyll-Robertson pupil (with absence of both direct and consensual light reflex) has been observed in two instances not including the case here presented. Wilbrand and Saenger,(12) in their extensive monograph, under the discussion of unilateral fixed pupil, do not record any cases similar to the one here presented.

Lutz(5) explains the phenomenon of reflex iridoplegia by placing the lesion in the region of the photomotor center. He states that "minor lesions only interrupt the connection of the direct light reaction path and leave untouched the collaterals going to the other side; in such cases, the consensual reaction is found present in both eyes." Wilson,(3) in a closely argued presentation of the subject of the Argyll-Robertson pupil, presents the matter a little more concretely. He believes the most common localization is in the neighborhood of the aqueduct, where colliculomotor fibers may be caught before they enter the oculomotor nucleus, and from which the accommodation fibers are far removed. Both Lutz and Wilson present extensive bibliographies.

REFERENCES

1. Mehrtens, H. G., and Barkan, O. Researches on the Pupillary Reactions in Epidemic Encephalitis. Am. Arch. Neur. & Psychiat., 10:399–409 (Oct.), 1923.
2. Dunn, J. Report of Several Pathological Pupillary Cases with Especial References to What Constitutes a True Argyll-Robertson Pupil. Arch. Ophth., 47:469–481, 1918.
3. Wilson, S. A. K. Some Problems in Neurology. I. The Argyll-Robertson Pupil. J. Neur. & Psychopath., 2:1–25 (May), 1921.
4. Caspar, L. Beobachtungen über einseitige reflectorische Pupillenstarre. Arch. f. Augenheilk., 54:53–63, 1906.
5. Lutz, A. The Light Pupillary Reflex, its path and its abolition called immobility of the pupil to the light reflex, and report of a case of a unilateral Argyll-Robertson pupil, in which consensual reaction existed in both eyes. Arch. Ophth., 47:266–294, 370–400, 1918.
6. Mott, F. W. Syphilis of the Nervous System, in a System of Syphilis. London, Oxford Univ. Press, 4:324, 1910.
7. Babinski, J. De l'influence de l'obscuration sur le réflexe des Pupilles à la lumiere et de la pseudo-abolition de ce réflexe. Rev. Neurol., 13:1214–1218, 1905.
8. Berger, E. Erhaltene consensuelle Pupillen reaktion bei fehlendem Lichtreflex der Pupille. Centrbl. f. Augenh., 1891.
9. Bechterew, W. Les Fonctions nerveuses, in Encyclopédie Scientifique. Paris, O. Doin & Sons, 1:365, 1910.
10. Jessop, W. H. H. On the Consensual Pupillary Light Reflex in Cases Exhibiting the Argyll-Robertson Pupil Symptom in One Eye. Tr. Ophth. Soc. U. Kingdom, 11:179–182, 1890.
11. Piltz, J. Experimentelle Untersuchungen über die Topographie der Kortikalen Pupillenbewegungszentren. J. f. Psychol. u. Neurol., 8:161–165, 1908.
12. Wilbrand, H., and Saenger, A. Die Neurologie des Auges. München und Wiesbaden, J. F. Bergmann, 9:146–148, 1922.

Society Proceedings

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

Regular Monthly Meeting, March 19, 1925, Wm. Healy, M.D., President, in the Chair

SPINAL FLUID PRESSURE READINGS IN EPILEPSY

Dr. Wm. G. Lennox

It has long been known that marked increase in intracranial pressure causes convulsions. Recently one writer (Leriche) states that hypotension also may be a factor in the production of convulsions. Weed and others have suggested alteration of intracranial pressure (by use of hyper- or hypo-tonic solutions) as a method of treatment of epilepsy. For these reasons it is important to determine if there is abnormality in the pressure of the spinal fluid of persons subject to recurring convulsions.

Of the thirty-three patients we have examined to date, almost all have had normal spinal fluid pressures. In six instances the initial pressure was 200 mm. of spinal fluid or more. Spinal drainage was done with a number of these patients, without resulting change in the number of convulsions. In one case of status, however, there was complete cessation of seizures for a period of eight hours following the drainage. In the preceding eight hours there had been nineteen seizures. In this patient pressure of the spinal fluid was observed during seven convulsions. During the tonic stage of the more severe of the convulsions the spinal fluid pressure increased nearly 600 mm. to a height of more than 700 mm. There was not an initial fall of pressure, but observations made twenty-four hours later (when the initial pressure was low) showed a fall at the beginning of the convulsions to a negative pressure of 50 mm. It is suggested that the marked fluctuations observed were the results of changes of intrathoracic pressure. These observations are to be extended to a large series of cases.

Dr. A. Myerson: Will Dr. Lennox tell us if he has any opinion on Cuneo's work on the metabolism of starches in epilepsy.

Dr. H. C. Solomon: Does Dr. Lennox or Dr. Mella feel that there is any relation between glioma and epilepsy? Regarding the question of pressure findings: In these attacks of a convulsive nature, pressure goes as high as 700 mm. in a partial open system. What effect does that have on the brain ventricles? Does this lead to hydrocephalus?

How high does pressure go in an ordinary sneeze? Sometimes it will rise to more than 500 mm., which gives us some idea of the amount of trauma the brain stands in daily affairs. In these high

pressures what happens to the mechanism of the brain? There is some sort of equilibrating mechanism whereby cerebrospinal fluid tends to keep a definite base level, and that level varies very markedly with some patients. Some have a base level of over 100 and some of 200, but they tend to reëstablish themselves by some mechanism of which we have no record at all. In this particular case of epilepsy what happens to this mechanism whereby equilibration is brought into play? We know nothing of the equilibrating mechanism of the cerebrospinal fluid pressure whereby it tends to stay more or less at a constant level and does not vary very much except for momentary oscillations.

Dr. Lennox: Autopsy of a patient from whom the observations of spinal fluid pressure during convulsions were obtained, showed a glioma of the temporal lobe with extension into the pia covering the brain. The tumor offered no explanation either for the convulsions, which had begun some eight or ten years before, or of the cause of death. It is doubtful if dilated ventricles are the result of the increased cerebrospinal fluid pressure during convulsions. At least, Cobb's rabbits, which had been subjected to convulsions over a considerable period of time, showed no such dilatation.

THE THERAPEUTIC USE OF DEHYDRATION IN HYPOMANIA

Dr. Donald Gregg

From the pathological laboratory are reported two observations which have been accepted without question. First, that many alcoholic delirium cases coming to autopsy show wet brains, and second, that experimentally brain bulk can be reduced by the administration of hypertonic salt solution. This latter observation has been utilized in brain surgery. Whether there is any correlation between increased brain bulk and excessive mental activity such as is commonly seen in hypomania is an interesting speculation. Clinically many procedures which presumably lessen cerebral congestion and brain bulk have been used with successful although often temporary results. Dr. D. Munro reported last month on the beneficial results of lumbar tapping in cases of head injury. Alcoholic delirium cases are often temporarily helped by lumbar puncture. The old Relief Station cocktail containing a strong dose of Epsom salts has benefited many an alcoholic, if not promptly lost. The hot pack and the prolonged warm bath have an undoubted sedative effect, and presumably draw fluid from the cerebral region to the body and limbs. The mustard foot bath and the warm bath at bed time are time-honored remedies. Cerebral congestion can probably be somewhat reduced by skillful massage. Whether the beneficial results of an effective dose of castor oil sometimes seen are due to relief from so-called autointoxication or to dehydration has not yet been determined. Having in mind these laboratory and clinical observations, the following case experience is interesting:

Mr. X., twenty-three years of age, of excellent Anglo-Saxon

stock, was recently brought to me for treatment in a typically hypomanic condition. His family history disclosed no reason for his condition because of inheritance. His past history showed that he had had no previous attacks of excitement or depression. Ordinarily, he was a quiet, shy individual, interested in artistic and intellectual activities, but without evident productive ability in artistic, musical or literary lines. He had previously had no stirring sex activities, and no handicapping physical infections. His life during his college years, and his relations with his family had not aroused criticism or comment. He was consdered a normal young man. About a week before coming under hospital care, he had become excited, talkative and restless. He conversed for eighteen hours at a stretch with a college classmate. He wrote out in detail his sensations and activities during twenty-four hours, and thought that this experience should be expanded into book form and printed, and that it would have a tremendously important influence in redeeming the world from its present difficulties. He had developed his physique marvelously in a week's time. He had discovered in himself an unsuspected ability to compose music and to sing. He possessed perfect pitch. Running through his excitement was a strong sex activity. With some difficulty he was persuaded to get to bed and was urged to try the effect of the horizontal position on his mental activities. Physical examination showed a well developed young man without evidence of physical infection or deformity. His tendon reflexes were generally increased. He was fifteen or twenty pounds under his normal weight. His pulse rate was markedly variable. His systolic blood pressure was 155. He was given an ounce of magnesium sulphate in warm saturated solution by rectum. The result of this injection was a copious watery movement twenty minutes later followed by another dejection after three hours. He slept six and a half hours that night without other medication. The next morning he was much quieter and somewhat clearer. He was willing to remain in his room quietly, spending most of his time in bed. The injection of magnesium sulphate was repeated that evening with a double dejection resulting. The next afternoon he was sent for a walk in the woods with a nurse, after a calm forenoon. In the evening he was given a third injection of magnesium sulphate. He slept eight and a half hours that night. The next morning he showed considerable insight. He said that he had got his feet on rock bottom again. Since then convalescence has continued uneventfully. At the end of a week his father thought him as normal as before his illness. In four days he gained eight pounds. Blood pressure reading dropped to 135 systolic.

This case is reported as one showing typical symptoms of hypomania but of unusual brevity. Improvement followed immediately after moderate dehydration with magnesium sulphate. Whether this dehydration bore any relation to the unusually rapid improvement is problematical. Dehydration with magnesium sulphate by rectum is, however, so simple in application and seemingly so innocuous that it deserves further trial.

Dr. E. W. Taylor: Dr. Solomon has just stated to me that he had a patient at one of the institutions who came out of a hypomanic state

in forty-eight hours without any medication. I should suppose that theoretically this method might be serviceable, but that one ought to have a very large number of cases before drawing any deductions. Improvement was certainly most striking in this case.

Dr. Gregg: Answering some of the questions raised in the discussion which I am pleased to have incited by this brief communication, it seems to me that inasmuch as the magnesium sulphate was expelled in twenty minutes with much accompanying fluid, not much, if any, of the drug could have been absorbed to produce a systemic effect. I have not yet had an opportunity to try this treatment on a chronic case. To be sure, there are not infrequently seen cases of acute excitement that clear rapidly. Some are given purgatives, some hot packs, which are methods of dehydration more difficult to give than the treatment suggested in this paper. No conclusions are drawn from the experience reported in this single case. This paper merely suggests that the favorable results produced by eliminative treatment in the deliria may be due primarily to dehydration of the brain.

FIRST OF PAPERS REPRESENTING COMMONWEALTH OF MASSACHUSETTS RESEARCH ON CAUSES OF FEEBLEMINDEDNESS

Dr. Abraham Myerson

The literature of psychiatry and syphilis is almost unanimous in the belief that syphilis causes feeblemindedness. That syphilis can cause mental disease of the type exemplified by general paresis, and which is in its essentials inflammatory in nature, is, of course, undoubted. That it can cause an amentia, a retarded mental development, has not been proven.

In recent years, a good deal of work has been done on the Wassermann reaction in the schools for the feebleminded. A very interesting thing is noted. In the early days of the Wassermann reaction, and when small groups of the feebleminded are taken, the literature seems to show an excessive amount of syphilis in the schools for feebleminded. On the other hand, in the recent literature, and wherever large groups of the feebleminded are studied and compared with large groups of the nonfeebleminded population, there seems to be no essential numerical difference in the amount of syphilis. Thus, of the 3,911 inmates of the hospitals for the feebleminded in Massachusetts, that is, Waverley, Wrentham, and Belchertown, there is a total of 143 positive Wassermanns, which is a percentage of 3.6. A survey of the literature seems to indicate that that is about the percentage of positive Wassermanns in the large institutions where the Wassermann work has been done in a reliable way.

When an effort is made to check this up by a survey of the amount of syphilis among the normal, or nonfeebleminded, population, difficulties are met in the selection of cases, which has usually been among the sick, and by the fact that in each stratum of the population the

amount of syphilis seems to vary, so that in the higher social and cultural groups, there is distinctly less syphilis than there is in the lower social and cultural groups. Most of the feebleminded in Waverley, Wrentham, and Belchertown come from the lower social groups, in many cases from the very lowest, and on the whole, it may safely be said that the number of positive Wassermanns in these institutions is not greater than that in the child population as a whole. Thus, from the statistical standpoint alone, the evidence for syphilis as a cause of feeblemindedness is very slight.

Another way of attacking the problem is the clinical examination of those in the institutions who have positive Wassermanns. This was done in fifty-eight of the sixty-five patients with positive Wassermanns at the Waverley School for the Feebleminded. Of the fifty-eight cases, there were twenty-one in whom the Hutchinsonian signs were present in greater or lesser degree. I included as Hutchinsonian signs only those which definitely belong to this syndrome, since abnormalities of all kinds have often been classed as syphilitic, which are present in the nonsyphilitic almost equally. Definite neurological signs were found in fourteen cases, but these neurological signs were, in the majority of cases, by no means conclusive of neurosyphilis, because they are very common among the feebleminded, and even among the normal; for example, strabismus occurred four times without paralysis and without other associated neurological signs, and there were half a dozen cases of slight irregularities in the pupils with negative Wassermann in the spinal fluid. Wherever there were definite signs of neurosyphilis, there was paresis or some condition similar to those found in the adult, and in these cases the spinal fluid was positive. In other words, these were not cases of *amentia,* but, so to speak, of *dementia.* Of the fourteen lumbar punctures that were done, all were negative with the exception of three cases, and in two of these the Wassermann was positive, in one it was doubtful. There was some change in the albumin and globulin. In other words, the examination of these patients, in the vast majority of cases, showed no definitely well recognized signs of syphilis of the nervous system.

The incidence of definitely known feeblemindedness in the ancestors was twelve. By ancestors is meant here father or mother or both. The number of cases in which the family history was unknown, due to the fact that the children had been abandoned, and where the circumstances were strongly suggestive of very low moral, and probably mental, status in the parents was twelve. Cases of extremely low social and moral standing, aside from the cases already cited where the mental status of the parents could not be determined, but where there was good reason to believe it was low, were eight. Cases where one or more siblings were feebleminded and in hospitals for the feebleminded totaled ten. All of these facts put together make it seem more likely that in these cases, at least, the cause lay in familial situation rather than in syphilis. In other words, syphilis was coincidental, rather than causative. In at least six of the sixty-five cases there was every reason to believe that the lues was acquired,

since these were young women whose sex career before they came to the hospital was distinctly promiscuous.

In the cases where there was no family history to indicate a cause, and where there was no evidence of neurosyphilis of any kind, there was, on the whole, nothing to distinguish the feebleminded person from the mass of the feebleminded of the institution. There was one Mongolian; there were two dwarfs, strongly suggesting endocrinological disturbances of some kind. Several of these positive Wassermanns were typical low-grade idiots, with the coarse features, brush-like hair, cyanosed hands, and automatic movements, resembling what Dr. Fernald often called the "blue-sky idiot," *i.e.*, coming from normal families. In other words, these cases indicated the same kind of problems that unknown feeblemindedness does, and in so far as our present experience goes, they were not present in greater or lesser number than in the mass of the population at Waverley.

As a sort of check on these cases, some records of Dr. Harry C. Solomon's clinic were studied. Of the forty-seven cases of congenital syphilis under treatment at his clinic, there were eight juvenile paretics, one case of neurosyphilis, three cases of doubtful mentality, twenty-eight normal individuals, one case of unknown mentality, and six mental defectives. Of the mentally defective individuals in the Solomon cases, one had a father who was in prison for manslaughter, three had mothers who were definitely mentally defective, and one had a mother and father of low grade. In other words, in these six cases, there were at least four in whom the ancestors alone would have been regarded as cause enough for the feeblemindedness in the descendants.

In studying the neuropathology of "syphilitic feeblemindedness" one is impressed with the paucity of material studied. It may be stated that no real study of any importance has been done. Most of the studies have been on the fetus or on the extremely young infant. In such cases there is an active neurosyphilis and active general syphilis. Wohlwill's study seems to me to indicate that in the older children there is no definite evidence that any retardation or developmental anomaly of the brain has been caused by syphilis. In other words, pathology does not help us, as yet, in determining whether or not syphilis can retard mental development, since the only material studied has been that of infants overwhelmed by syphilis either prenatally or shortly after birth.

Conclusion: That syphilis causes mental defectiveness, aside from the rare cases of juvenile paretics, has not been proven. On the whole, the evidence is rather against this point of view than for it.

Dr. G. L. Wallace: A considerable number of our positive syphilitics have acquired the disease. This is especially true with the girls I am not prepared to say exactly how many. In connection with Dr. Myerson's survey, which reduces to a minimum syphilis as a causative factor for feeblemindedness, I question a little whether, in the debilitating effect syphilis may have on the progenitors, it may not be responsible indirectly, to a degree, for mental defect where there is no positive reaction obtained. But his findings quite agree with our

observations, that the majority, excluding the comparatively few pathological cases of mental deficiency, are simply, as Dr. Fernald used to express it, a question of a lesser degree of intelligence. Dr. Myerson's findings in this particular, in not making syphilis responsible for as large a number as we used to think before the Wassermann tests were taken on our patients, is rather in line with the observations of Dr. Fernald and a good many of the rest of us who have been in the work for some time.

Dr. William Healy: A few years ago at the University of Chicago a prolonged bit of research was done by Dr. Stevens along these lines. He did his work, it seemed to me, very curiously. He held syphilis as being responsible for a great deal of feeblemindedness, between 30 and 40 per cent. I was very much amused because just about the time he came out in favor of this high percentage, there appeared the report of work from Denmark which falls in closely with what Dr. Myerson says, and the percentage of possible responsibility of syphilis for feeblemindedness was, if I remember it correctly, less than 5 per cent. I know it was extremely low. We are up against the fact, as Dr. Myerson says, that the Wassermann test does not always show a positive reaction, and we have to fall back on the so-called stigmata, particularly upon Hutchinsonian teeth, and there we come to a very peculiar difficulty because nobody has ever yet accurately determined what syphilitic teeth really are. I have talked with many upon that subject and strangely enough very few people in this country seem to be at all aware of the apparently important work of Cavallaro which was translated and appeared in the Dental Cosmos of 1913 or so, with copious illustrations. He maintained that he had been able to discover in congenital syphilitic fetuses much evidence of great infection of the dental alveoli and that this was present at its maximum at the third month of intrauterine life, when the anlage of the second incisors and cuspids was forming. This is a very interesting study. The upshot of his paper is what we call Hutchinsonian teeth; the peg-shaped incisors with crescentic erosions are by no means the only kind of teeth indicative of syphilis. And that is the state we are in at the present time in regard to exact knowledge of which teeth are really indicative of congenital syphilis.

Dr. Myerson: One is rather surprised that there is no greater percentage of positive Wassermann reactions among these children. The families from which they come, in very large numbers, live in the most deplorable social and cultural conditions, and in very many cases sex life begins early, the sex life of the mother and father both are promiscuous, so that the number of positive Wassermanns might easily relate to the types of life the parents led. About Hutchinsonian teeth, those I accepted as Hutchinsonian were the definite and well-known types with concave margin of incisors and peg-shaped bicuspids.

Current Literature

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Stein, R. O. Cause of Baldness. [Wiener klin. Woch., Jan. 3, 1924. J. A. M. A.]

Stein believes that the theory that seborrhea is the main cause of baldness, is entirely out of the question. Seborrhea affects both sexes, and it also affects the whole scalp of the man. Yet baldness occurs practically only in men, and does not affect the whole scalp. Examining the typical baldness in young men, he had the impression that the whole affection is only the pushing up and lack of the normal anterior margin of the hair. This led him to observations on the anterior borders of the hair in normal subjects. He found that this border forms an arc in children and women. After puberty, however, the hair at the side of the forehead in man begins to fall out, and he considers this as a typical secondary sex character, which he calls the " frontal calvities of adolescents." It is known that this part of the frontal region is also a point of predilection for secondary sex characters in certain male mammals. Another center of loss of hair is the parietal region. He found the bald triangles on the forehead in a case of premature puberty, and in some women with other masculine characters, especially hypertrichosis. The anterior border of the hair forms a perfect arc in eunuchoids, just as in children. This baldness is only a secondary male sexual character on a seborrheic soil.

Lortat-Jacob and Legrain. Scleroderma and Syphilis. [Progrès Méd., Feb. 9, 1924.]

Lortat-Jacob and Legrain direct attention to the fact that syphilis, as one factor among others, has not been given due consideration in the etiology of sclerodactylia and generalized scleroderma. They report very good results from specific treatment with mercury and arsenicals.

Lipschutz, B. Etiology of Herpes Zoster. [Wien. klin. Woch., 37, 183.]

Zoster vesicles contain the so-called zoster bodies. These are products of a specific reaction on the part of the cells, especially of the nuclei, to the virus of the living parasites. Inoculation of zoster material into the corneæ of rabbits has been observed to produce the same cell changes as in the human cutaneous afflorescences. This finding corroborates the theory of the infectious origin of herpes zoster.

The clear content of zoster vesicles was injected cutaneously into three children and intracutaneously into one child. In two of the cases of cutaneous injection a number of clear vesicles formed about the point of inoculation, about eleven days later. These vesicles lasted for two or three days and dried up. In the case of the child who had received an intracutaneous inoculation, infiltration and reddening appeared four days later, and lasted for several days. These children, who had never had varicella were exposed to infection with this disease. The three children who had been successfully inoculated remained free from the disease, whereas the other child developed varicella. This would indicate some connection between herpes zoster and varicella and also further corroborates the infectivity of herpes zoster. Cornelia de Lange has observed positive complement-fixation in a case of herpes zoster and in cases of varicella by means of antigen prepared from scabs of varicella eruptions. This would indicate the identity of the etiologic factor in these two conditions. In the case of six children who had died of intercurrent infections during varicella, the intracostal ganglia presented hemorrhages and perivascular infiltration with leukocytes.

Cramer, W. and Drew, A. H. Some Effects of Light on Organism. [British Jl. of Ex. Path., Oct., 1923. J. A. M. A.]

The physiologic action of light from an ordinary mercury vapor bulb on the animal organism was studied by Cramer and Drew. Rats born and kept in darkness frequently show a diminution in the number of blood platelets as compared with rats kept on the same vitamin-poor diet in a well lighted room. This thrombopenia is sometimes associated with a definite anemia. Exposure of such animals to a mercury vapor lamp increases the number of blood platelets to normal, and, if an anemia is present, it increases the number of red cells. Rats kept in darkness do not exhibit intestinal lesions such as are found in vitamin A deficiency, nor do they develop the bacterial infections (xerophthalmia, septic lymph glands) characteristic of that deficiency. They do, however, develop these conditions sooner, when placed on a vitamin A deficient diet, than rats kept in a well lighted room. Rats kept on a vitamin A free diet develop a progressive thrombopenia and an atrophy of the intestinal mucosa. Exposure to a mercury vapor lamp, if applied from the beginning of the deprivation of this vitamin, delays the thrombopenia. If applied after a thrombopenia has set in, it will increase the number of platelets. Such exposures to light, however, do not prevent the eventual onset of the atrophy of the intestinal mucosa which results from the vitamin A deficiency. The conclusion is drawn that light is a stimulus to the formation of blood platelets. This explains the partial antagonism between vitamin A deficiency and exposure to light; light can counteract the one lesion—thrombopenia—produced by vitamin A deficiency, but cannot prevent the eventual atrophy of the intestinal mucous membrane. Exposure to light can, therefore, delay but cannot prevent the eventual cessation of growth

and the eventual onset of bacterial infections resulting from the vitamin A deficiency. Absence of light accelerates the onset of these conditions. Light is, however, not an essential condition for the formation of platelets, and its absence can be counteracted, so far as the platelets are concerned, by an abundant supply of vitamin A. The fact that conditions which stimulate the production of platelets will delay the development of certain types of bacterial infections is further evidence in support of the view that platelets represent a mechanism against bacterial infection. [The part played by the vegetative nervous system (chromatophores, etc.) is neglected, only gross terminal stages being utilized in the authors' thinking.]

Sézary and Dessaint. White Dermographia. [Bul. de Soc. Med. des Hôp., Oct. 12, 1923.]

The intensity of the white line produced on the abdominal skin by a slight stroke, according to these observers, does not depend on sympathetic tonus. At least it has no constant relation to the oculocardiac reflex. Epinephrin prevents its formation simply by contracting the vessels. It is absent in complete asystole, and reappears in the stage of cardiac compensation.

Léri, A. and Péron, N. Trophedema. [Bul. de la Soc. Med. des Hôpitaux, Dec. 28, 1923.]

Two cases of trophedema of a lower extremity are here reported. One of them was associated with occult spina bifida. The roots of the nerves of the affected extremity were much thinner than on the other side. Another case was associated with lymph stasis due to lymphatic calcification.

Sprunt, T. P. Lipodystrophia Progressiva. [South. Med. Jl., May, 1923, J. A. M. A.]

The chief point made by Sprunt is that the factors producing the atrophy do not necessarily remain completely effective, that fat can be deposited again in the parts from which it has disappeared. In his two cases the treatment consisted of: rest in bed, a full and varied diet, with extra nourishment after meals, general massage, three times a week, and small doses of sodium cacodylate administered hypodermically every day.

Rothacker, A. A Treatment of Scleroderma. [Münch. med. Woch., 1924, 71, 159.]

Two c.c. of terpichin was injected intramuscularly twice per week in a case of diffuse atrophic scleroderma accompanied by 1 c.c. prepared anterior hypophyseal lobe. Within six weeks the patient was able to climb stairs, the articulations were mobile, and the skin looser. Further dosage was followed by gradual improvement of the articular function, the outward appearance and contractures remaining unchanged. The

method of treatment was then slightly modified. On one day 0.5 gram terpichin and 0.5 gram prephyson were administered intramuscularly; four hours later the dose was repeated; on the following day 1 gram terpichin was given. Eight days later the same course was repeated and again four weeks later. Later the prephyson was replaced by thyroglandol without appreciable improvement in the results. This treatment resulted in considerable functional improvement. The patient was able to walk and use her hands. The facial expression improved and lost its mask-like character. The skin of the body could be lifted to some extent without pain. The asphyxia and cyanosis of the skin on the fingers and toes decreased, although the extremities remained cold. Abnormal pigmentation persisted.

In spite of the absence of struma, Rothacker administered thyroid and thymus substance, and applied roentgenotherapy. The skin became more elastic following the irradiation. No nervous or thyrotoxic effects were noted, and no enlargement or diminution of the thyroid or thymus gland was visible on the roentgenogram.

Cohen, Harry. Scleroderma and Gangrene. [Annals of Surgery, Dec., 1923.]

In this study the author describes two instances of scleroderma with resulting gangrene of the fingers. The first patient, a Russian, aged twenty years, for five years had had trouble with his right hand, followed by pain in the fingers of the left hand. He manifested advanced general scleroderma, the skin of his face being tight and drawn and he could only with difficulty open his mouth. Several amputations were necessary on the fingers of each hand owing to the tendency of the gangrene to spread. The second patient, a Russian woman, had general scleroderma, her face and body being severely affected. The tips of the fingers of both hands became gangrenous and required amputation.

2. ENDOCRINOPATHIES.

Gray, S. Menorrhagia in Young Girls. [Lancet, Dec. 16, 1922, II, No. 5181. J. A. M. A.]

Inasmuch as an immense majority of cases of excessive menstruation are unassociated with palpable or obvious structural change, Gray would emphasize that menorrhagia is the one condition which does not demand immediate pelvic examination, even in young girls. Unless the symptoms of hemorrhage were absolutely urgent, examination should be postponed until after trial of medical treatment. In most cases the examination will not be needed and the girl will escape the discomfort of an anesthetic. In Gray's opinion the greatest defects in the upbringing of adolescent girls are in providing for them insufficient sleep and almost no real leisure. In the high school and secondary type of school—more especially in the latter—the girls are too hard driven on the working days, the games being

almost as much a matter of " drive " as the lessons. Excessive homework is often either permitted or connived at. Parents should be taught that the whole organization of the life of their daughters ought to run more quietly. Not by three days in bed every month, but by an hour or two longer in bed every night; and not by a too strenuous term succeeded by a too strenuous vacation, but by a steady and well regulated interchange of work and play they will best promote the health of their girls—of work that is well within the compass of the girls.

Apelian, A. S. The Effect of Fear on Menstruation. [Letter to Bost. Med. & Surg. Jl., Jan. 11, 1923.]

The fact that fear and other psychic phenomena modify or even suppress the regular menstruation, is well known to the medical profession.

I want to emphasize this known fact and try to tell the results of my personal observations to the readers of the Boston Medical and Surgical Journal.

During the world war thousands of Armenian women were driven from their homes into the plains of Syria and Arabia, where they lived under a reign of terror. As the result of fear and uncertainty of the future, and anxiety for their killed beloved, 80 per cent of mature women stopped menstruating, and some showed mental derangements. Of course, later on malaria and other anemic conditions raised this percentage. This condition lasted until the days of armistice. During that period, in spite of amenorrhea, impregnations were not infrequent. Immediately after the armistice these women returned home, and in spite of the same poor hygienic and dietetic conditions, a great majority of them started menstruating within three months. After a year they had reached the normal limit.

The removal of the terror and the bright hopes of a future stimulated them to normalcy. But recently the same conditions returned, and according to the reports of my doctor friends, amenorrhea reappeared among the terror-stricken women of Smyrna and Anatolia.

Voronoff, S. Studies in the Transplantation of Organs. [Repertorio de Medicina y Cirugia, March, 1922.]

The author states that among the unicellular organisms which constitute the earliest type of living beings Voronoff tells us that cellular division goes on taking place throughout many generations without a single instance of death occurring, and when from loss of substance a colony undergoes a certain degree of retraction, instead of dying, its members are seen to unite, being rejuvenated and rendered more active by this fusion, and so going on to a new series of divisions. The ameba does not die: it may be destroyed by an enemy or by lack of sustenance, but it knows nothing of physiological death. In higher organisms the cells which approximate nearest to the primitive type are the connective tissue cells and leucocytes, which are also the most universal. A study of old

age teaches that the connective tissue cells invade more and more the structure of organs, producing sclerosis, a phenomenon seen alike in the brain and the bones, the arteries and the muscles, the liver and the kidneys. When tissues are grafted they are deprived, while new vessels are forming, of nutrition by means of the circulation: during this period the differentiated cells of the graft atrophy, while the connective tissue cells endure and fill their place when circulation is reëstablished. Life, the function of all the organs, is dependent on the activity of the glandular system.

Wesselink. Pseudo-Hermaphrodism as Cause of Sterility. [Ned. Tijd. v. Genees., Nov. 18, 1922, II, No. 21.]

A clinical report of cases of sterility in women of masculine aspect who the author observes are sought less in marriage. Eight cases are discussed, coming to him on account of sterile wedlock. Evidences of pseudo-hermaphrodism were found with tardy and scanty menstruation, and a masculine growth of hair on the body, with other male features accentuated.

Sand, K. Hermaphrodism. [Ugeskrit för Laeger, LXXXIV, No. 30, p. 921.]

In this study a child of ten years of age had been assumed to be female. Then it was thought to be a boy and handled accordingly. Feminine traits then later appeared and an abdominal exploration was done. Even this did not decide the sex. The sexual gland on one side seemed to be a testicle and on the other side an ovary. Each corresponded to an early fetal structure. He advocates waiting for puberty to decide the issue.

Kreis, L. Vegetative Nervous System in Menstruation. [Gynécologie et Obstétrique, V, No. 6, p. 543. J. A. M. A.]

Kreis asserts that the play of the antagonist systems in the vegetative nervous system is more complex than has been hitherto recognized. The abnormal conditions are more variable, and may affect only part of the system. In some cases of amenorrhea described, excessive vagotony became reduced to normal as menstruation was reëstablished or was started by ovarian and other treatment. Tests for excessive tonus in the vagus or sympathetic system may clear up many dubious conditions, and serve as a guide to treatment in endocrine derangement.

Benjamin, Harry. The Steinach Operation, Report of 22 Cases with Endocrine Interpretation. [Endocrinology, Nov., 1922.]

The principle of the Steinach operation is to close the vas by ligating with nonabsorbable material and resecting a short piece thus preventing recommunication of the stumps, and to preserve the blood supply. According to Steinach's theory this procedure causes, through back pressure and later inactivity, an atrophy of the generative portion of the

testis with subsequent proliferation of the so-called puberty-gland, consisting mainly of the interstitial (Leydig) cells. The clinical results vary from nothing more than an "endocrine tonic" to an almost actual "rejuvenation." The indication was premature and physiological senility and sexual impotence, both interpreted as hypogonadism with or without accompanying dysfunction of the other glands with an internal secretion. An attempt is made to classify the reported cases according to their endocrinological constitution and also to interpret the patient's symptoms and changes after the operation from an endocrine point of view. The results were classified as (1) negative, if no changes occurred after a period of six months or more, that could be attributed to the operation; (2) subjectively positive and doubtful, if the patient stated improvements subjectively only, doubtful regarding endocrine interpretation. No full scientific value can be attached to these cases. (3) Positive if clear evidence, for instance objectively, of a beneficial effect was on hand, in some cases naturally only partial. The histories of twenty-two cases are given, of which sixteen were sufficiently long observed, to warrant judgment as to results. Of these sixteen cases, nine are considered positive, four subjectively positive or doubtful, and three negative. The cases are described with special regard to their endocrine aspect and the observations are summarized as follows: The most frequent and most prominent clinical manifestations as the result of the new activity of the puberty gland seem to be due to the increased thyroid activity. Outside of the thyroid, the reactivated puberty gland seems to influence essentially those glands that are most prominent or delinquent in the patient's constitution. Distinct changes in the gonodal sphere appeared mostly in patients with a gonadal or partly gonadal constitution. These conclusions are regarded mainly as a theory. The following, however, must be considered as well established scientific facts, also deduced from the above observations: The Steinach operation increases the activity of the puberty gland. This reactivation has an influence on the endocrine system in the sense of stimulation, regeneration, and restoration of equilibrium. No injurious effects have been observed. Regarding prognosis, only a very vague opinion can at present be expressed that a gonadal or partly gonadal constitution seems to be most promising. [Author's abstract.]

Etienne, G. The Ovarian Origin of Chlorosis. [Rev. méd. de l'Est, May 15, 1922, p. 329. B. M. J.]

This author observes that the discoveries of Brown-Séquard and his followers brought about a new conception of the nature of chlorosis and of its origin. It may be regarded as an auto-intoxication produced by a perversion of ovarian function. He classifies ovarian function as follows: (1) external secretion (ovulation); (2) elimination of toxic products at the menstrual period; (3) internal secretion, which plays an important part in the general nutrition. Chlorosis, therefore, is a toxic disturbance, amenorrhea arresting the elimination of toxic products, while the failure

of the internal secretion has profound effect on nutrition and the composition of the blood. He refers to recent researches on the internal secretion of the testicle and of the ovary and their effects on the general development of the individual, and states that in sixteen cases opotherapy has had striking results. In periods ranging from three to six weeks the red corpuscles have rapidly increased in number (in one case from 1,500,000 to 4,495,000). At the same time the number of abnormal corpuscles has diminished and the specific gravity of the urine has increased, with a proportionate increase in the excretion of urea and of phosphates. At the same time the patients' weight increased rapidly. The author and Prenant suggest that the corpora lutea provide the ovarian internal secretion. He refers to the general cellular activity of puberty and suggests that if the ovaries become active at this period and menstruation is established, the first corpus luteum is formed, and its internal secretion plays its part in the general development. Quoting the analogous cases of thyroid insufficiency and the production of myxedema, the author suggests that ovarian insufficiency results in chlorosis. He believes that, prior to the development of ovarian activity, growth and development may be controlled by the thyroid and thymus, and that chlorosis may occur in the "physiological interregnum" resulting from too early retrogression of the thymus or retarded development of the ovary. The author considers that all the conditions to which chlorosis is usually ascribed—insanitary environment, deficient ventilation, improper food, etc.—act by arresting normal ovarian development. The author states that the administration of preparations of iron, in addition to that of ovarian extract, hastens the improvement in the condition of the blood.

Parhon, C. J., and Parhon, Constance. Pseudohermaphroditic Cock. [Endocrinology, VI, 1922, 383.]

The case of a cock is described the testicles of which had been modified by a pathological process and which possessed two structures having the appearance of the oviducts in the laying hen. (According to our observations there is a regression of the oviducts during brooding in connection with the endocrine modifications, which, according to our opinion, determine the brooding state.) Since no signs of ovarian tissue were found, the "oviducts" are difficult to account for. The endocrine organs other than the gonads appeared normal. The case is to be regarded as one of pseudohermaphroditism. [Author's abstract.]

Carrara, M. Malformations in Sexual Deviates. [Riforma Medica, 38, No. 19, p. 440; J. A. M. A.]

Carrara is director of the Istituto di Medicina Legale at Turin. He writes to protest against the traditional assumption that, because a person is suspected of being a sexual pervert, any abnormal conditions found in the sexual organs or anus are necessarily the result of "sexual delin-

quency." He declares, on the contrary, that the abnormal conditions may have been primary, and they may have been a factor in the sexual psychopathy. His text is a recent medicolegal case in which a daughter accused her father—a man prominent in social and business life—of incest rape, and presented a medical certificate to the effect that the vagina and anus were so large and smooth that they proved multiple sexual relations. The physician who signed the certificate confirmed it in the witness stand, and the court was more than disposed to accept his view.

Kreuter. Testicle Implants. [Deutsch. Zeitschrift für Chirurgie, 172, No. 5–6, p. 285.]

The author here advocates microscopic examination later of a transplanted testicle in order to determine the actual facts in regard to gonad grafts. He knows of only one report of this kind (Rössle), but has had an opportunity himself in two cases to remove an implanted testicle three weeks and two years after the grafting operation. Complete necrosis of the reproductive elements and extreme reduction of the interstitial cells was found in the testicle removed in three weeks. In the other case, the ingrafted testicle had been totally absorbed in the course of the two years.

Marinesco, M. G. Steinach's Operation and Rejuvenescence. [Journ. de méd et de chir. prat., June 19, 1922, p. 416.]

At a recent meeting of the Académie de Médecine, Marinesco described his recent researches in continuation of the work of Ancel and Boniss, who first described the "interstitial gland" of the testis. He refers to the experiments of Steinach (1920), who endeavored to awaken the activity of the interstitial gland in aged rats by a resection of the vas deferens after isolating it from the blood supply of the testis. The results were in many cases remarkable: increase in weight, of activity and pugnacity, recovery of sexual powers, etc. Lichtenstern performed the same operation on three men, and this was followed by signs of general physical and mental rejuvenescence. However, the statements of Steinach have not been confirmed by the majority of German observers. Some have come to the conclusion that suggestion played an important part; others have questioned the separate existence of the "interstitial gland." Marinesco's researches have convinced him that there is a histological specialization of the interstitial tissue, at least among mammalia, and that ligation of the vas deferens produces an hypertrophy of the interstitial gland, but there our hopes must end. He performed the operation on three aged patients: two suffered from paralysis agitans and one had tabes dorsalis. He observed, at first, increase of muscular strength and of activity, with a return of sexual power, but no phenomena which justified the description "rejuvenescence." The sexual activity disappeared at the end of two months, and in one year the patients were in the same state as before. The author thinks that Steinach's anticipa-

tions were ill founded. Senile processes do not depend on anatomical and histological changes but on protoplasmic cellular alterations. All the organic and inorganic colloids follow an inexorable vital curve; their senescence ends in dehydration of the colloidal particles; precipitation follows agglomeration. On the other hand, the theory of nonreversibility dominates biology. Growth and differentiation are essential conditions of life; differentiation once acquired is irrevocable; a differentiated cell cannot return to the embryonic form—it is condemned to die, and disappears when senility no longer permits it to fulfil its function. [B. M. J.]

Goldberger, M. A. Pseudohermaphroditism. [Am. Journal of Obstetrics and Gynecology, IV, No. 2, p. 130.]

This case the author terms pseudohermaphroditismus feminus. External female organs were present and normal except for an overdevelopment of the clitoris. However, internally, there was a rudimentary testis in the right labium majus. The ovaries, uterus and tubes were apparently absent. Two aunts on the father's side never menstruated or bore children and they had no mammary development.

Gotta, H. Vitamin B and the Sexual Glands. [C. R. Soc. de Biol., Feb. 10, 1923, p. 373.]

Though several workers have noted the fact that deprivation of vitamin B leads to degeneration or atrophy of the germinal tissue of the sexual glands, their experiments have often been open to criticism on the ground that the basal dietaries employed have been insufficient to avoid a certain element of starvation—and it is known how sensitive these glands are to inanition. To avoid this objection the author adopted Simonnet's vitamin B free diet—one which, besides containing several varied constituents, includes a quantity of meat residue—and gave it in such amount as to exclude any possibility of starvation. Working with pigeons, he divided them into three groups. To the first group of 9 he gave the basal dietary; to the second group of 7 the basal dietary with the daily addition per bird of 2.5 grams of fresh beer yeast to ensure an ample supply of vitamin B; while the third group, acting as controls, were allowed a full diet of maize. In eighteen to thirty days after the commencement of the experiment the pigeons of the first group showed symptoms of polyneuritis; those of the second group appeared perfectly healthy. All three groups were killed. At autopsy it was found that those birds which had been deprived of the B constituent had lost considerably in weight, while the size of their testicles was only about one-tenth that of the controls. Those of the second group, which had received the B factor, had actually gained slightly in weight, but their testicles, when compared with those of the controls, were seen to be diminished in size by about one-half. Histological study of the sexual glands of the first group showed a marked retrogression of the germinal tissue; the canaliculi were narrow, lined by only one or two layers of cells, and

showed no spermatozoids. These facts can be explained on three hypotheses: (1) that the yeast supplied sufficient of the B factor to avo.d the symptoms of polyneuritis, but not sufficient to prevent the sexual atrophy—in which case the testicle may be taken as a delicate reacting agent to the presence or absence of vitamin B; (2) that in the basal diet employed there was some necessary, but unknown, factor missing; or (3) that the meat residue had a deleterious effect on the testicle.

II. SENSORI-MOTOR NEUROLOGY.

1. CRANIAL NERVES.

Mackenzie, G. W. Some Remarks on the Weber, Schwabach and Rinné Tests. [Laryngoscope, June, 1922.]

The author was led to prepare this paper because of the following facts: (1) That these tests when carefully conducted afford the otologist the best qualitative means available for determining the anatomical site of the lesion responsible for loss of the hearing function, partial or complete; (2) Besides in the hands of a skillful examiner they may, when carefully timed in combination with air conduction tests with tuning forks, serve as quantitative tests subject to limitations as are other present day methods; (3) That in spite of the above mentioned facts there exists too often a looseness in the method of conducting the tests even by credited otologists. One may observe otological clinics here and there where an attempt is seldom made to conduct these few simple tests even in those cases undergoing treatment for deafness. The explanation for this neglect may be one of several.

(a) Forks may not be available, or what are available may be unsuitable for the purpose.

(b) Lack of faith in the tests brought about by a carelessness in technique which naturally leads to irregularity of findings and in turn to lack of interest. The same holds true in other fields. In photography, laboratory work or vestibular diagnosis, in fact in anything of a technical nature, careful technique is the one big essential to success.

(c) Lack of time to apply the tests.

(d) Lack of ability to conduct them.

(e) Indifference.

The absence of suitable forks is productive of erroneous findings in testing a patient's hearing. Experience has shown that the fork best suited for conducting the functional hearing tests is one of 190 D. V. or thereabout with weights possessing a normal audibility for air conduction of between 100 and 120 seconds and a normal bone conduction of about 70 seconds. This will give a positive Rinné of 40 seconds.

The Weber test is used for the purpose of determining whether the sound of the vibrating fork is heard better on one side than on the other

when the tip of the handle is pressed moderately firm against the skull just below the hair line, and midway between the two ears.

The test should never be made by applying the tip of the fork to the teeth, since a maxillary sinusitis will impair the conductivity of that side and thus give a false reading. The degree of lateralization of the Weber test should be accurately specified in inches to the right or left, or as indifferent, if not lateralized. It will also make for a greater accuracy if the test is timed; at the same time it will serve as a check on the Schwabach test.

The Schwabach test requires more careful technique and attention to detail than is needed in making the Weber test. It serves the purpose of determining whether the bone conduction of the patient being examined is equal to, greater than, or less than normal. The examiner should be careful to apply the tip of the handle of the tuning fork to corresponding areas over the mastoid and exerting the same amount of pressure on each side. (The writer prefers to use the hollow area just behind the pinna that corresponds to the antrum region.) To lessen the possibility of fatigue, the pressure should be exerted intermittently. In a general way, a case that has bone conduction *longer* than normal is considered as one that has a disease of the conducting apparatus. Should the bone conduction prove *shorter* than normal, the possibility of disease of the perceiving apparatus is to be considered. However; it must be remembered that when making the Schwabach test, we are taking not alone the bone conduction of the side to which the fork is applied but of the two sides together. Of course, the major portion is contributed by the side to which the fork is applied. This fact,—the possibility of borrowing and contributing of bone conduction—should be borne in mind and due allowance made for it when interpreting the Schwabach and Rinné tests. The Rinné test is designated as positive when the air conduction is longer than bone conduction, as neutral when air conduction and bone conduction are equal, and as negative when the bone conduction is longer than the air conduction. The same fork is used in making the Rinné test as the Weber and Schwabach tests. In addition to the precautions used in making the Weber and Schwabach tests the greatest care should be exercised to see that the fork is held in a definite manner and at a definite distance from the external auditory meatus. Fatigue should be avoided with the same care and in the same manner as when taking bone conduction. The facts should be borne in mind that a vibrating tuning fork held horizontally will not vibrate as long as one held vertically, and that it will vibrate slightly longer when held suspended than when held upright. The fork should be held at an equal distance from the patient's ear and from the ear of the control, and in the position best suited to permit of direct transmission of the sound with the avoidance of nodal or dead lines. The difference between air and bone conduction should be timed so that one may know how near to the normal it is. If a case

under examination shows a positive Rinné of 40 seconds with a fork that shows the average normal to be 40 seconds, the case may be one that is normal or one in which a neurolabyrinthitis is present. If now the air conduction is found to be normal we may feel sure that the hearing is normal. On the other hand, if the air conduction is found to be shorter than normal, then the positive Rinné of 40 seconds points to a disease of the perceptive apparatus. The object of the paper is to draw attention to the Weber, Schwabach and Rinné tests, most important phases of the subject of otology, the value of which is in direct proportion to the technique used. [Author's abstract.]

Snell, A. C. Hereditary Glaucoma Simplex. [N. Y. St. Jl. Med., April, 1923.]

A. C. Snell classifies glaucoma as infantile, juvenile and senile. The first is the familiar buphthalmos or congenital glaucoma and is confined to the first decade. The juvenile or hereditary form manifests itself from the tenth to the fortieth year, it is always a direct inheritance and appears in consecutive generations. Contrasted with the enormous cornea of buphthalmos the cornea is small, *id est* under twelve millimeters. The anterior chamber is shallow and the form may be acute or chronic and finally the sclerotic has its normal color. Half the patients are myopic. An instance is described in which the father developed glaucoma at fifty and the son at thirty-five years of age—an example of "anticipation." Another family is reported in which the mother suffered from glaucoma when sixteen, the eldest son at fifteen years and a daughter shortly after thirteen. All these were myopic to the extent of about five diopters. The two brothers had coloboma of the optic nerve and the girl a persistent nerve sheath surrounding the disc. Iridectomy seems to be of little value, probably trephining is the most suitable operation.

Gold, H. Seat of Mydriatic Action of Cocain. [Jl. Phar. & Exper. Ther., June, 1924.]

Experimental evidence is presented by Gold which indicates that cocain mydriasis is not due to paralysis of the circular muscle fibers of the iris, but to an action on the sympathetic. While cocain does not stimulate the sympathetic endings in the iris, it probably renders them more excitable to stimulation.

Brouwer, B. Experimental Investigations on the Topographical Representation of the Retina in the Primary Optic Centers. [Schweiz. Arch. f. Neurol. u. Psychiat., 1923, XIII, 118. Med. Sc.]

The topography of the retinal projection in the primary optic centers, corpus geniculatum externum, and corpus quadrigeminum anticum, is imperfectly known. The author has studied the course of the Marchi degenerations following circumscribed lesions of the retina in rabbits and

cats. A needle is introduced into the eye, and under direct ophthalmoscopic vision one or more quadrants of the retina are incised. The animal is killed after eighteen days, and the brain treated by the Marchi method. Serial sections are then cut through optic nerves, chiasma, optic tract, and the primary optic centers mentioned above. The following results were obtained. Evidence of a topographical distribution of retinal fibers is present throughout the visual pathway from optic nerves to primary centers. In the nerves, upper retinal quadrant fibers lie dorsolaterally and lower quadrant fibers ventromesially. With regard to the chiasma, it is difficult to make a definite statement, but since, in the optic tract, fibers from the upper retinal quadrants lie ventral to those from the lower quadrants, there must be, in addition to a decussation, a vertical rearrangement of fibers in the chiasma. In the corpus geniculatum externum there is a sharply circumscribed representation of the retinal quadrants, fibers from the upper quadrants lie ventral to those from the lower, and temporal retinal fibers lie mesial to nasal fibers. There are thus four sharply-defined areas corresponding to the four quadrants of the retina. A similar well-defined localization is found in the corpus quadrigeminum anticum. When this is viewed from above, the lower temporal quadrant is represented anteriorly, the upper nasal quadrant posteriorly, and these two areas are separated by the junction of a mesial area in which the lower nasal quadrant is represented and a lateral area for the upper temporal quadrant of the retina. In respect of the pulvinar of the optic thalamus, Brouwer believes that it is doubtful whether that part of the thalamus which contains retinal fibers in the rabbit is homologous with the pulvinar of higher mammals. The majority of degenerated fibers observed in this region were probably fibers of passage on their way to the corpus quadrigeminum anticum. These results cannot, the author points out, be directly applied to the higher mammals and man, since the corpus geniculatum externum in apes and man is somewhat different in form and position. F. M. R. Walshe.

Shinkle, Clyde E. A Case of Raynaud's Disease Involving the Feet, the Left Retina and the Heart Wall. [Journal A. M. A., Aug. 2, 1924.]

The author cites a case of Raynaud's disease or arteriospasm, involving the feet, the left retina and the heart wall, which afforded an opportunity to watch the actual process in a living artery through an ophthalmoscope, and to see the good effect of amyl nitrite on the arteriospasm. The patient was benefited by large doses of potassium iodid by mouth, and by the hypodermic administration of sodium nitrite. Hemoglobinuria and a moderate rise of systolic and diastolic blood pressure accompanied exacerbations of the trouble. Nervous instability and shock may have played a role in the sequence of events, in this and some other illnesses of this patient.

Moore, Irwin. Bilateral Paralysis of the Laryngeal Abductors. [Journal of Laryngology and Otology, May, 1923, Aust. M. J.]

"Cordopexy" is the name given by Irwin Moore to an operation for overcoming the stenosis of the larynx due to bilateral abductor paralysis of the vocal cords. He considers the various methods which have been employed for this purpose, including simple division of the recurrent nerves, reëstablishment of nerve continuity by resection and anastomosis, cordectomy, arytenoidectomy, ventriculectomy, evisceration or ablation of the vocal cord and the soft parts lining the larynx and lastly ventriculocordectomy. None of these can be depended upon to secure the desired patency. In the method of cordoplaxy a thyreofissure is performed, a small triangle of cartilage (sides about six millimeters long) with the anterior end of the vocal cord attached is excised, the periosteum in the vicinity being elevated to release the cord and a small circular opening punched in the cartilage just wide of the triangular opening. Into this opening the anterior end of the vocal cord can be drawn laterally and anchored. Transferring a vocal cord six millimeters (one-quarter of an inch) from the middle line was found to be sufficient to fix it in the position of complete abduction.

2. PERIPHERAL NERVES.

Carter, H. S. Causalgia and Allied Painful Conditions. [Jl. of Neurology and Psychopathology, Vol. III, No. 9, p. 1.]

Intraneural and perineural sclerosis is the essential pathology of causalgia. The irritation set up at the site of injury causes reversed afferent impulses to be sent back to the cord, and possibly further to the subcortical and cortical centers, and thence efferent responses of vasodilator, secretory, and trophic natures are reflected to the peripheral distribution of the nerve, where reaction on the end organs and sensory corpuscles in this area is interpreted as pain. The reason why lesions of this type of the median nerve and internal popliteal fibers produce a true causalgia in some cases, pain of less severity in others, and in the remainder nothing but the discomfort of partial sensory loss, is difficult to answer. It is improbable that inflammatory reaction to different groups of organisms provides a solution. It hardly seems possible that irritation of a special group of fibers is the cause, for causalgia is rare, and it is not within the range of probability that such fibers should be so seldom involved. The most that can be said is that there is some peculiarity in the trauma of the nerve in these few cases, which causes disturbance of those cells in the brain whose function it is to interpret pain. By resection of the irritated and sclerosed portion of nerve, the source of the perverted impulses is removed and the pain vanishes; and by restoring the continuity of the nerve, the path for normal impulses is remade and gradually

recovers its conductivity as the nerve regenerates. Details of twenty-four cases are given.

De Josselin de Jong, R. Tumor of Nerve Tissue. [Beitr. z. path. Anat. u. z. allg. Path., LXXI, 182.]

The tumor had the aspect of a congenital large cyst of the region of the neck. It was surgically removed when the infant was one month old because of its increase in size. The operation was not particularly difficult because the cyst was enclosed in a thin connective tissue capsule of its own. The cyst contained a watery transparent fluid and its wall consisted of a particular tissue formed of many neuroglia cells, many nerve cells either arranged in groups or scattered here and there, nonmedullated nerve fibers and spaces lined with ependymal cells. In addition, some psammous bodies and fragments of a tissue similar to that of the choroid plexus and tela were found.

Veraguth, O. Neuritis. [Schweiz. med. Woch., Vol. LII, No. 19, p. 445.]

Several cases of polyneuritis from different toxemias are here reported. One with irritating and paretic features occurred in a guide. An attack of botulism poisoning with pronounced polyneuritis and a Korsakoff syndrome was another. Polyneuritis had developed after two operations for recurring mammary cancer in a third. It included the fifth, sixth, and twelfth cranial nerves. In another case carbon monoxid was the toxic agent. This was a peculiar source of the gas. It was given off from burning phonograph records which had become ignited from a cigar as he fell asleep. Twenty-four hours later, when he came to, he was lying on the floor, his legs paralyzed and also the right facial nerve and shoulder muscles, and he and the room were covered with soot. The polyneuritis was intensely painful for six months but disappeared. Paralysis of arms and legs in another case was traced to naphtha used in automobile industries.

Wholey, C. C. Excessive Golf Followed by Musculospiral Palsy. [J. A. M. A., Dec. 9, 1922.]

A man, aged thirty-five, complained of severe pain which would come on as soon as he lay down, and which disturbed his sleep. The pain was located to the left of the spine over the lower part of the neck. The peculiarity of the pain was that it would largely disappear when the patient was up and about his work, but, no matter what position he lay in, it would continue. Examination revealed a pronounced weakness involving all of the extensor muscles of the left upper extremity. The ability to extend the wrist against resistance was very slight. In fact, the wrist was held in a partially wrist-drop position. Extension of the fingers, and at the elbow, and at the shoulder were proportionately weak. The hand

grip was also very much reduced in strength. There was a similar weakness in the power of supinating the forearm. It was evident that there was an involvement of the entire musculature supplied by the musculo-spiral nerve. All of the deep reflexes of the extremity were exaggerated. There was some tenderness on pressure over the nerve trunks. The peculiar circumstance of the pain being so noticeably aggravated by the patient's lying down, together with the existence of the tender area along the lower neck behind, made the author regard the nerve involvement as being largely of root origin. It seemed likely that a slight pull on the nerve roots was in some way brought about by the change of position, this accounting for the severe pain when the patient was recumbent. This man led a very active life, and was an enthusiastic golf player. He had been crowding in his daily golf, in spite of excessively long and arduous business hours. And there was superadded to his general nerve fatigue a focalized nerve strain sufficient to induce a neuritis.

Fox, Howard. The Relief of Pain in Herpes Zoster by Paraffin. [J. A. M. A., Dec. 9, 1922.]

A colleague who had suffered from a very severe attack of thoracic herpes zoster suggested the use of an occlusive dressing of paraffin to the author, and he has followed the procedure in twenty selected cases. The method was reserved solely for those patients who were suffering from pain severe enough seriously to interfere with sleep. Experience soon revealed the fact that the best results were obtained by a daily application of the paraffin, it seldom being necessary to continue the treatment for more than a week. In even the severest cases, the applications of the paraffin gave almost immediate relief and were regularly followed by more or less freedom from pain for twenty-four hours and by a complete night's rest. The most convincing proof of the efficacy of this treatment was shown by patients who had obtained complete relief from pain, but who for some reason or other had not returned for several days, during which time the pain had returned. By further treatment, the pain was again promptly relieved. The technic of treatment consisted simply of spraying the melted paraffin with an atomizer on all of the cutaneous lesions and covering such areas with a generous layer of absorbent cotton, held in place by bandages. In a few cases the paraffin was applied by cotton swabs, an equally efficient, although slower and less convenient, method. When fresh applications were made the previous layer of paraffin was gently removed. The form of paraffin used was parresine.

Aievoli. Lumbago and Sciatica. [Rif. Med., May 22, 1922.]

This review refers to a series of 1,578 cases recorded by Lindstedt. One group could be correlated into various articular or spinal deformities, inducing a disturbance of the dorso-lumbar muscular mechanics. Some cases seem due to excessive muscular exertion. Others may be due to

changes in the nervous supply of the muscles. Sciatica is not a constant clinical entity but rather a symptom complex not precisely delimitable. Many cases of sciatica are associated with definite lesions of the neighboring organs, and might be looked on as a neuralgia from irradiation, or reflex, comparable to trigeminal neuralgia.

Salomonson, Wertheim. Low Sacral Neuritis. [Psychiat. en Neurol. Bladen, No. 5, Sept.-Oct., 1922, p. 344.]

Salomonson reports three cases of low sacral neuritis. The common sacral neuritis is almost always limited to the area of the second sacral root, although very often some of the branches of the second, third, or fourth lumbar roots are also involved; in all these cases the fourth and fifth sacral roots are spared so that there is no sensory change in the anus or genitalia and there are never any vesico-rectal or sexual disturbances. In this respect these lesions are distinguished from cauda equina lesions. In the cases of lower sacral neuritis there are sensory changes in the fourth and fifth sacral areas, without any objective or subjective abnormality in the bladder or rectum and presumably also in the sexual functions. Usually cases of lower sacral neuritis begin with severe pain in the back, buttock, or leg, and often in the lumbar region on one side, so that at first one thinks of a lumbo-sacral neuralgia or a simple sciatica. The sign of Lasègue quickly appears. Then usually we have simultaneously appearing the sensory changes and a somewhat flaccid or atrophic condition of the gluteal, hamstrings, calf, and sometimes also the peronei muscles. The ankle-jerk diminishes, gluteal sign becomes indefinite or disappears, while the plantar reflex is generally minus. The sensory changes are limited to the lowest sacral areas. The diagnosis is difficult: there may be a tumor, either of the cauda equina or the pelvis, or even an extramedullary spinal cord tumor or a vertebral tumor. In these organic cases the signs and symptoms usually increase in intensity. But fortunately there are others in which the pain lessens, the muscles begin to feel firmer, the sensory changes lessen, and after from three to six months recovery takes place without any detectable residual defects. These cases often are peculiar in that at a particular stage of their disease the objective sensory change is completely limited to the anal region (on one side). In the diagnosis of these cases of what clinically is a lower sacral neuritis stress is laid on the age of the patients. In one of the cases shown by Salomonson (the oldest) some fear was felt that there might be a tumor at work; in the two younger patients a diagnosis of a lower sacral neuritis seemed permissible. As to the cause, one can merely surmise a so-called rheumatic origin or an intrapelvic inflammation; the latter is especially likely in women. Many of the cases are badly constipated or have irregular and sluggish evacuations; there may also possibly be circulatory disturbances at work. And finally some cases appear to occur in connection with cold, especially cold baths. As these cases have been seen by Salo-

monson more often during the last few years than formerly, the possibility of some previous influenza or other infective disease has to be borne in mind. [Leonard J. Kidd, London, England.]

Replogle, J. P. Sprains of Rhomboideus Minor Muscle. [Ann. of Surg., November, 1922, LXXVI, No. 5; J. A. M. A.]

Examining into the causes of this injury, such as swinging a sledge, firing a furnace, lifting a heavy object, sudden pulling upon objects with arms extended, Replogle found that pain occurs at the end of the pitch of a shovel or at the end of the swing of a sledge; in other words, at the position where the lateral angle of the scapula is raised and the rhomboideus minor is on the greatest tension. Clinically, pain is produced only on those movements which elevate the lateral angle of the scapula, change the angle of the spine, and depress the base of the spine of the scapula, producing tension on the rhomboid muscles. Occasionally there is slight pain and tenderness near the spinous process of the last cervical vertebra at the origin of the rhomboideus minor, and in 30 per cent of the cases there was slight tenderness along the vertebral border of the scapula below the spine in the region of the rhomboideus major. The treatment is based on anatomic lines to cause relaxation of the overstretched muscle. The shoulders are thrown back so as to lessen the interscapular space and criss-cross adhesive straps are applied maintaining this position. The arm is placed in a sling and a small pad placed under the adhesive over the point of tenderness to possibly hasten the absorption of the serous effusion at the point of rupture or strain. This treatment gives immediate relief from aching, and pain on abduction is greatly reduced. Replogle says that the frequency of occurrence of sprain of the rhomboideus minor, the unusual constant symptomatology and clinical picture, the efficacy of simple and proper treatment, together with the fact that it is of sufficient seriousness to cause industrial disability, demand cautiousness for diagnosis of this lesion.

McGuire, E. R., and Burden, J. F. Unusual Case of Sarcoma of Median Nerve. [Surg., Gyn. & Obs., Oct., 1922, XXXV, No. 4.]

A woman, forty years of age, had had for five years a swelling on the right forearm, midway between the wrist and elbow. It was neither painful nor tender, and remained constant in size for a long time. Suddenly the affected forearm began to swell, and after five weeks the right forearm was half again as large as the left and pain developed. A mass about 8 inches in diameter, apparently connected with the median nerve, was excised. Spindle cell sarcoma, originating in a neurofibroma was the diagnosis. Five weeks after operation a swelling returned. Amputation of the arm was advised but refused, and she was treated with roentgen ray and radium. Three months later the arm was amputated. A mixed cell sarcoma was the diagnosis.

Smeesters, E. Paralysis of Scapular Girdle. [Arch. Fr.-B. d. Chir., July, 1922, XXV, No. 10.]

In this girl of fifteen there had been from childhood a paralysis of the deltoid and other muscles of the scapular girdle. She could not use the right arm which was also markedly atrophied. Tendon and muscle plastic operation, arthrodesis, plaster cast and physical training were done. The results were surprising.

III. SYMBOLIC NEUROLOGY

3. PSYCHOSES.

Leahy, S. R. The Problem Child. [N. Y. State Jl. of Med., Jan., 1923, XXIII, No. 1.]

Every child has become a problem—at least to some one. The different tasks to which it is put; the various viewpoints from which it is judged, all vary so considerably that only one acquainted with the wide variants within the psychiatric discipline is really sensible enough to know what it is all about. Special conduct disorders are here dealt with from the psychiatric viewpoint. Pedagogy must know more psychopathology. Classroom scholastics are often sterile mumble jumbles.

Wimmer, A. Traumatic Neuroses. [Uges. f. Laeg., Nov. 2, 1922, LXXXIV, No. 44. J. A. M. A.]

Wimmer explains that the traumatic neurosis is the physical and mental manifestation of an emotional shock. The emotional shock may have been so severe as to induce temporary amnesia, and thus the causal shock may not be remembered. He explains that this *enfant terrible* of accident insurance requires the same impartial analysis of its symptoms and causes as the material consequences of a trauma, and proper treatment as a pathologic condition.

Hoffmann, H. Tuberculosis as Causes of Mental Disease. [Arch. f. Psych. u. Nervkr., Vol. LXVI, No. 5.]

Hoffmann advances a narrow theory of the tuberculous origin of the greater number of cases of dementia precox and melancholia and of a lesser number of cases of amentia and mania. He would designate such psychoses in a group as paraphrenia phymatosogenes with approximately the following subdivision: (1) Depressive form (melancholia), (2) expansive form (mania), (3) hallucinatory form (amentia), (4) stuporous form (dementia precox). Diagnosis must be based first upon the elimination of syphilitic affection and then upon the following positive factors: Tuberculous inheritance, past scrofula, chronic middle ear disease. Examination for tuberculosis must be thorough and repeated

including X-ray. Therapy should include ordinary treatment for tuberculosis and Ponndorf's tuberculin. Early and generous inoculation continued for not less than three years with inoculations perhaps once a month may be counted on for possible favorable result. [Were he acquainted with such studies as those of Nolan Lewis on dementia precox, he might get a more penetrating insight and see that tuberculosis *and* dementia precox may be the simultaneous working out of an original difficulty. Instead of one causing the other, they both are due to something more essential in the background of the personality.—Ed.]

Kehrer. Spiritism, Hypnotism and Psychic Disturbance; Superstition and Delusion. [Arch. f. Psych. u. Nervkr., Vol. LXVI, Nos. 3, 4, 1922.]

Kehrer discusses among psychogenic exceptional states a spiritistic psychosis. There is about as much justification for speaking of this as caused by preoccupation with spiritism as for attributing any other psychosis to occupation with the complex associated with it. He believes that exclusively with feminine natures with reactive lability and marked pseudohallucinatory disposition psychic disturbances may arise upon a basis of a peculiar emotional character conditioned in part by special events in life and having a direct connection with the practice of spirit writing (psychographia), the nucleus of these disturbances consisting of scene-like hallucinatory experiences beside variable psychogenic symptoms. In some of these cases spiritistic occurrences constitute the essential cause of the illness, in others spiritistic content exerts a decisive influence upon the symptom formation of the psychic disturbance chiefly due to other causes. Kehrer believes also that for the present we have not sufficient psychological insight to define clearly the concept of hysteria. [To those who know nothing of the psychoanalytic technic this is quite true.]

Uramoto, S. Physiologic Study of Yoga. [Sei-I-Kwai Medical Journal, Vol. XLI, No. 463, p. 1. J. A. M. A.]

Yoga or other similar religious abstract meditation is usually adopted as the method for religious mental training by Buddhists of the Sen sect (Dhyana) and by the Hindus. With the former, the bodily conditions of yoga are somewhat definite, while the mental conditions are somewhat various. In most cases, however, attention is concentrated on a question set for meditation. The mental and physical conditions can be considered as a special case of hypnotism, perhaps even as a state of autosuggestion, because in this case, the mental state can change positively, which change is not possible in entirely negative mental conditions of pure hypnotism. Uramoto endeavored to investigate the changes of blood pressure and rate of respiration during yoga. He made his observations on a priest of Dhyana, thirty-eight years of age, who had spent the twenty years of his religious life in the Sen sect of Buddhism. The pulse curve

and respiratory movements became lower during the yoga, but not slower or irregular. The curve always recovered its original height several minutes after the subject awakened. Uramoto is convinced that these changes are the symptoms of restrained functions, which from the point of view of psychophysical parallelism are physical conditions reacted on by mental conditions. In certain cases the pulse curve becomes suddenly lower even to an almost straight line. This may be a symptom of the sudden entrance into trance, which can only be performed by long practice. Then, again, the respiratory movements become irregular in depth, without any change in the pulse. Such symptom may occur in disturbed meditation owing to unfavorable mental and physical conditions. In this experiment, there was no such remarkable change in the respiratory functions as Imai observed in his experiment when the respiratory sounds were hardly audible through the stethoscope.

Sylvester, Reuel H. MENTAL MEASUREMENT IN RELATION TO MEDICINE. [Jl. Iowa State Med. Soc., Aug., 1922.]

Measurement of mind began with the measurement of reaction time. Next it was found that vision, audition and other senses could be measured. Later memory and other more complex processes were analyzed and measured, and during the past fifteen years psychologists have plunged boldly ahead on the assumption that all mental processes can be measured, the chief difficulties being in isolating them and in devising measuring devices. Because each mental process is made up largely of others and so, literally, cannot be isolated, and because general psychology has not yet completed the analysis of the mind and the evaluation of its elements, results of analytical measurements cannot in all cases be summarized in terms of general grade of intelligence. Hence there have been devised socalled measuring scales of general intelligence. Of these, the Stanford-Binet Scale has proved to be the most reliable. Its results are stated in terms of mental age and intelligence quotient. For use in loose sorting out of individuals from large groups, certain standardized group tests are serviceable. So complex and subtle a series of functions as mind cannot, of course, be measured in the simple manner of such static quantities as weight and height. A rather wide variety of information on the individual's history, his environment and his habitual attitudes and thought processes must be at hand, in order that one may properly interpret and evaluate responses to mental tests. One must have a thorough knowledge of normal psychology as well as experience in the applied field. The relation of the mental measurement or psychological laboratory to medicine is essentially that of bacteriological X-ray, and other laboratories. The results of a mental measurement may contribute both to the physician's diagnosis and to his treatment and handling of a patient. The mental measurement result does not often reveal disease or acute ailment of the mind, but it gives the physician exact information as to the grade of intelligence

and the mental strengths and weaknesses of his patient, and it may point to causes and conditions that otherwise would be overlooked. [Author's abstract.]

Bessau, G., Rosenbaum, S., and Leichtentritt, B. The Nervous Complex in Infantile Intoxications. [Mon. f. Kind., Aug., 1922.]

G. Bessau, S. Rosenbaum, and B. Leichtentritt conclude that: (1) The nervous complex of intoxications consists of coma, deep respiration, catalepticlike conditions, convulsions, vomiting, and symptoms of disturbances of the vegetative nervous system (fever and subnormal temperature). (2) The possibility of an abnormal permeability of the epithelium of the corneum cannot be excluded in the presence of a positive result with the Löwi reaction. (3) Disturbances of temperature and the symptoms of the nervous complex are most closely related; the disturbance of temperature is a less characteristic, but more delicate symptom, but both phenomena are probably the expression of a central disorder. (4) Starvation does not cause a recession of the nervous complex. (5) The administration of food, *per se,* seems to be harmless and only in an indirect way can it act injuriously through the production of diarrhea or vomiting, which, in turn, are the causes of an dessication of the organism. (6) The increased permeability of the gastrointestinal canal is not an absolutely necessary prerequisite for the development of the nervous complex and the increased permeability certainly does not in itself lead to the appearance of the nervous complex. (7) With a material of alimentary intoxication, it is impossible to decide definitely whether or not the infection of the upper segments of the intestine with colon bacilli is a prerequisite for the occurrence of the nervous complex; to decide this, it is necessary to include numerous experiments with infections which show the symptoms of alimentary intoxication. (8) In every case in which the nervous complex occurs there are usually signs of extreme desiccation and an oliguria or anuric condition. (9) The anuria is not the result of an anatomical or functional renal disease, but it is due to extrarenal factors. (10) The residual nitrogen values in the fully developed nervous complex vary extremely in different cases, values between 17.1 and 176.4 having been observed; there is no relationship between the residual nitrogen content and the nervous complex.

Key and Pijper. Syphilis and Mental Deficiency. [South African Med. Record, April 22, 1922, p. 142.]

Syphilis as a cause of mental deficiency in two hundred and seventeen cases is here studied. The diagnosis was based upon the Wassermann; the stigmata were very seldom present. Mental deficiency was judged by intelligence tests, the Stanford revision being used. The mental age of an adult idiot as under three, of an adult imbecile as between three and seven, and of an adult feebleminded as between seven and eleven

years, border-line cases being excluded. The highest degree of positive Wassermann results occurred in the lowest degree of idiocy—and of the two hundred and seventeen serums xamind one hundred and twenty (55.2 per cent) were positive. To a certain extent the incidence of the test decreases as age advances, and the same applies to its intensity after the age of twenty-five. There does not appear to be any symptom, or group of symptoms, common to those giving a positive reaction, and it is doubtful if the syphilitic virus is the sole agent responsible for the amentia in all the cases, some other predisposing cause probably being present in most of them, syphilis, though a sufficient factor in itself, often exerting a deciding influence where morbid heredity or other unfavorable conditions are present. Could the family histories have been thoroughly investigated it is highly probable that a fairly large proportion of them would have shown a neuropathic inheritance, and, if ever such investigations can be systematically undertaken, the institution of antisyphilitic treatment in parents, and their children from birth, would exercise a decided check upon the growth of the mentally deficient population in South Africa.

4. MEDICO-LEGAL; SOCIAL.

Diller, Theodore. The Opportune Appearance of Mental Symptoms in Those Accused of Crime or Facing a Crisis in Life. [Am. Neur. Assn., 48th Annual Meeting, May, 1922, Washington, D. C.]

If an individual develops mental symptoms at such a convenient time as the day of his arrest the suspicion arises in the average mind that he is "putting on" and so firmly does this impression take hold of many minds that it can hardly be dislodged by the presentation of a fair amount of reasoning based on evidence. Dr. Diller in discussing this question presents the histories of three cases bearing on it, one the case of a woman facing separation from her husband and children and two in which mental symptoms developed in individuals after being arrested for crimes. The first case is briefly condensed as follows: A man of great potential mental growth marries a simpleminded girl. The man grows rapidly, the wife stands still. They grow apart. Things become tense and the wife goes to a summer resort and while there writes a letter to her husband, sexual in complexion and delusional in character. Standing alone it would suggest to any alienist, I think, that the writer was affected with dementia precox. Afterwards the patient repudiates the letter, insisting it was a dream. Her insight was excellent and she showed a fair appreciation of the situation. This woman of a one-cylinder mind developed under strain a dementia precox episode. This quickly disappeared leaving her the same simpleminded woman she was before. The second case is that of a promoter arrested in the midst of the crash of his business. His mind is a blank for events since 1900. There is complete analgesia which is universal. He exhibits Vorbeireden (speaking

beside the mark) and Dammersustand (twilight consciousness) indicative of an hysterical psychosis—and this may be considered a reaction to his env ronment. The third case represented symptoms of paresis—grandiose ideas, tremulous face, exaggerated k.j.'s and marked speech defect. However, laboratory findings were negative and the man showed considerable insight and with all his figuring his additions and subtractions were always correct. Diller believes the situation as follows: Here is a man who is a born promotor. He had all the makeup of a promotor. The strenuous life of a promotor with considerable dissipation was followed by collapse, shock, arrest. The man is still an optimist but he is unnerved, in hypomaniacal state with exhaustion. He suggests paresis. These symptoms disappear and he comes down to a plain optimist and promotor which he always will be. He was undoubtedly suffering from a psychosis. Here the appearance of the symptoms was very opportune. *Conclusions:* We have here, then, three cases, two developing mental symptoms when accused of crime and one when facing a divorce case—at critical times in life. In all cases the mental strain on the ind vidual was beyond the breaking point—and the break occurred in each case. Diller thinks the genuineness of the cases cannot be questioned. In two cases the appearance of symptoms was very opportune but in the third case it was very inopportune; yet the cases are alike in this, that they represent mental breaks in individuals confronted by a great crisis in life and exhibit the individual's inadequacy to meet the s tuation. [Author's abstract.]

Barron, M., and Habien, H. C. Lead Poisoning. [Am. Jl. of Med. Sc., Dec., 1921.]

M. Barron and H. C. Habien have investigated the histories of four patients who died from lead encephalopathy due to the use of face powder and have reviewed the literature on this subject. The four patients mentioned were members of one family, the symptoms being headache, vom ting, colicky pains, constipation, convulsions and coma, followed by death. The blood showed marked anemia and very numerous basophile granules in the red cells. *Post mortem* examination of one patient showed the presence of lead in the liver and kidney and no other marked pathological change except wasting and a blue line on the gums. It was found that all the patients had made use of a face powder known as "Flake White" for more than a year. On analysis, this powder was found to be finely ground lead carbonate. The authors also report one nonfatal instance of lead poison ng and they refer to two other patients suffering from plumbism due to the same powder whose histories were published by T. W. Holland forty years ago. The frequency with which the diagnosis of lead poisoning is missed, is alluded to. Notes on the histories of six patients suffering from chronic lead poisoning admitted to the University Hospital, Minneapolis, are given. In four of these instances a wrong diagnosis was made before admission. The

importance of cosmetics as a cause of lead poisoning is strongly emphasized.

Ford, W. W. MUSHROOM POISONING. [J. A. M. A., LXXX, 25, 1923.]

It was formerly supposed that about a dozen varieties of mushrooms contained the poisonous substance muscarin. Now we know that about eighty species are poisonous. During the food shortage of the war the fields were searched for edibles, with the result that in Germany and Austria, particularly, many cases of mushroom poisoning occurred. There are certain main types of mushroom intoxication: (1) Entirely gastrointestinal, in which the attack ceases when the stomach is empty; (2) general catharsis, which is painless; (3) violent vomiting and pain, but no involvement outside the gastrointestinal tract; (4) a choleriform type producing widespread degeneration of the cells. There is an incubation period for twenty hours after ingestion, followed by a violent, painful gastrointestinal crisis. The patient appears to recover, but gets a relapse, with violent intestinal pain, collapse and death in a few days. In this type, the cells of the liver and spleen, and the voluntary and involuntary muscles show degeneration. There are evidences of attempt at repair on the part of the liver and kidney. The first symptom is a severe nephritis. Treatment in California which has been successful, has been mainly directed to the kidney, and with emptying of the intestinal tract and irrigation of the bowel with potassium permanganate solution. The last type is that of nervous system intoxication by muscarin, which comes on half an hour after eating the mushrooms. There are pin-point pupils; the eyes water; there are salivation and diarrhea. Patients die of the effect of the muscarin on the heart. The heart dilates and stops in diastole. Atropin is the physiologic antidote, given subcutaneously. There are two other rare types which may be mentioned, one caused by the morels, or helvella, which produce helvellic acid. These resist the action of the gastric juice and produce hemolytic intoxication. The patient voids chocolate-colored urine. Another kind, which looks like the meadow mushroom, produces an intoxication similar to ethyl alcohol. The patient is hilarious, has staggering gait, sees variation in the size of objects, and finally collapses in a stupor. The patients recover in these two types, but in weak persons and children, mushroom poisoning of any kind may produce death from heart failure.

Book Reviews

Rademaker, G. G. J. De beteekenis der roode kernen en van het overige mesencephalon voor spiertonus, lichaamshouding en labyrinthaire reflexen. [Eduard Ijdo, Leiden, 1924.]

This is a thesis offered, as is the custom in European universities, for advancement in rank in the faculty and for the attainment of the aspirant's "Doctorat."

It is a 381-page volume of large octavo pages and consists of the record of an enormous series of experiments upon the general problem of the reflex mechanisms underlying the general physiological functions of "Bodily Position." These studies were guided chiefly by Professor Magnus, whose interest in these problems has produced, with his colleague, Professor de Kleijn, a masterly series of contributions which have been classical in their importance and have reflected great credit upon the Dutch school of neurophysiology. These helps the author has acknowledged in his Introduction, further mentioning the names of Weiland, Wolf, v. Leenvey, Socin, v. d. Hoeve, and Dusser de Barenne as his aids or collaborators.

The details of these experimental studies upon cats, dogs, guinea pigs, rabbits, and apes, as they bear upon the more exact outlining of the synaptic nuclei and connecting fiber tracts which underlie the structural substrate of the physiological functions of the reflex mechanisms of segmental and suprasegmental bodily positions, are very minutely and exactly entered into, richly illustrated and logically evolved, making a most interesting and valuable complementary volume to Magnus' classic upon "Die Körperstellung," which has already been reviewed in these columns.

The chief features dealt with concern "Decerebrate Rigidity," "Functions of the Nucleus Ruber," "Tonic Labyrinthine and Neck Reflexes," "Neck Adjusting Reflexes," and "Static Progression Reflexes."

Upon the subject of decerebrate rigidity Rademaker states that extensor rigidity follows a section through the middle of the anterior corpora quadrigemina when through or caudad to the pars magnocellularis synapses of these collicular nuclei. Sections anterior to the oculomotor synapses and in front of the anterior quadrigeminal masses do not result in muscle tone disorder. Thalamic animals in whom Forel's decussation pathways are cut show decerebrate rigidity.

In the cat and the rabbit, and maybe in higher animals, the nucleus ruber is a synaptic nucleus in which regulation of "righting" of the body takes place, labyrinthine reflex arcs being involved in this nucleus. The adjustment mechanisms of the body to gravity (right-

ing) are certainly dependent upon nucleus rubra integrity. So far as these studies show when the section passes behind the caudal half of the anterior colliculus and dorsal to the superior cerebellar peduncle decussations these reflexes are not interfered with. This location then marks their caudad limitation.

Tonic labyrinthine and tonic neck reflexes depend upon the integrity of the brain stem behind the auditory synaptic nuclei.

The functions of the nucleus rubra are extensively entered into both from the clinico-pathological and from the experimental aspects. Here the author offers an extensive discussion of the work of previous clinical studies, chiefly of French and English clinicians. The chief fact that emerges from this critical study is that as yet clinico-pathological and experimental data are still insufficient to definitely afford clear-cut generalizations concerning the actual mechanisms involved, particularly as relating to the complex series of situations known as " tremor " and as " rigidity."

In spite of the recent accessions of much material—Wilson, Karplus, Kreidl—the work of Lewy, Jacobs, and others, and the clinician studies noted, it is quite evident that the phyletic condensations of closely interwoven and integrated associations and correllations are so intricate as to prevent for the time being generalizations which will stand the proof of his experimental material. This careful conservative attitude is quite commendable, for certainly the condensations of neuronic chain reflex activities in the mesencephalon will need a larger phylogenetic study in order to resolve their complexities.

In conclusion the reviewer can express the wish that this most valuable study should be available in a language less fraught with insuperable difficulties. We can at least express the hope that the author should follow the worthy example of the chief of the Utrecht school, Winkler, and put the chief features of his thesis into French, thus giving it a more universal opportunity for study.

Obituary

ALBERT MAHAIM

The entire medical world shares with France the loss of one of her most brilliant neurologists and psychiatrists in the passing of Albert Mahaim in March, 1925. His death succeeded upon an operation and removed him from an active career as instructor in psychiatry at the University of Lausanne and as director of the psychopathic hospital located at Cery, in the neighborhood of Lausanne. He left his imprint in many a brilliant investigation of the brain and study of its functional problems. Personally he was distinguished by the qualities of self-reliance, virility of character, and a nobility of spirit which combined sympathy, candor, and delicacy of feeling with a keenly intellectual readiness of humor, associated with gravity and clarity of thought. He thus brought to his work an endowment of mental abilities destined to give precision and clearness to obscure problems and to stimulate investigation along his chosen lines.

Trained in the methods of Forel and Gudden, he pursued his own way into further results in determining the interdependence of one part of the brain upon another, studied through the action of secondary degeneration. In direct continuance of Forel's investigations, Mahaim brought out clearly the connection between the optic thalamus, the nucleus of Goll and Burdach, and the red nucleus. He drew attention, in his studies of the complex nature of the posterior longitudinal bundle, to a small bundle joining the longitudinal fasciculus to the oculomotor nerve, not, as he first interpreted it, a part of the fifth, though later testimony shows that he was probably right in attributing it partly to the third nerve. He gave still more thorough attention later to the trigeminus, contributing to the knowledge of its motor root. He investigated also the band of Reil, revealing the interruption of its sensory portion at the thalamic level. He demonstrated in regard to the corpora quadrigemina that there is probably no cortical centripetal path extending from the cells of the posterior quadrigeminal tubercle as far as the temporal lobe.

Mahaim's investigations of the retina and optic nerve when diseased through intoxication by ergot revealed that vascular lesions preceded the destruction of nerve tissue. He made important con-

tributions to the knowledge of general paresis, through the discovery of the lymphocytic infiltration of the perivascular lymphatic sheath of the small cortical vessels. Much of his work in histology has found publication in two volumes prepared in connection with Voltaire Masius.

He devoted himself largely in later life to the problems of alcoholism and aphasia. Sensory aphasia had interested him even from earlier days. He had investigated the center of writing and that of projection and studied brain dissociation. He proved Flechsig incorrect in denying the existence of centripetal and centrifugal fibers in the area of association where these had seemed to be absent. He also defended Dejerine against Pierre Marie in regard to aphasia. He demonstrated the existence of the latter disorder with destruction of Broca's center, emphasizing the presence of both motor and sensory aphasia while the lenticular region remained intact.

His actual contributions and his stimulus to further research in problems which still await more complete solution proved their value while he still lived and worked. They leave no less a heritage to those who must continue to carry the work forward.

JELLIFFE

RICHARD CASSIRER

The loss to neurology caused by the decease of Richard Cassirer is one which is felt personally, also, by those who knew his ability as a teacher and enjoyed the privilege of work under this master of neurological diagnosis and surgery. Many of these are of other lands than his own. His death occurred August 20, 1925, after a long, severe illness, upon the gradual encroachment of which he only reluctantly laid aside his active work.

Cassirer was born in Breslau in 1868 of a well-known family. He was of a reserved personality, difficult of approach, but devoted to his work. He absorbed himself in scientific problems, gave loyal service in connection with his associates, especially his leader H. Oppenheim, and faithfully entered into the needs of his patients.

He was first associated with Wernicke as the latter's assistant in Breslau, and then for a time held a position as assistant to Kahlbaum in Görlitz. In 1893 he entered into service with H. Oppenheim in Berlin, where his brilliant and devoted work gave him high rank of his own and made him a worthy successor in the activity he was destined to carry on after Oppenheim's death in 1919. Associated with the latter at the Berlin *Poliklinik,* he took over the charge of this, to continue its service in clinical and scientific fields. He ren-

dered active service also during the war in the hospital established by Oppenheim and, further, as special adviser to the *Garde-Korps.*

Cassirer possessed the clinical ability and devotion which made him widely sought by patients, and which led to his indefatigable work in assembling a vast amount of clinical material for broad scientific study. He was a teacher who drew to him many students, who owe to him a rich instruction in the subject of neurology. His most distinguished work lay in the field of diagnosis and in the skillful surgery which followed upon his accuracy here. This gave him an especial field of service during the war, when he made valuable contributions in operative treatment of wounds of the peripheral nerves, in nerve suture and transplantation, and in the clinical treatment of injuries of the spinal cord, while in the diagnosis and localization of tumors of brain and spinal cord he has later particularly excelled.

Cassirer's publications are many. As early as 1903, he obtained his degree through an elaborate study of the psychic disturbances in tabes. Neurotic muscular atrophy, acute infantile spinal paralysis, familial idiocy, studies upon the cervical cord, are some of the subjects of his briefer works. His well-known work upon the vasomotor-trophic neuroses, published in 1901 and again in 1912, reveals his ability to gather together a vast amount of observed detail and submit it, together with former contributions of others, to thoroughgoing, discriminative scientific criticism. The *Handbuch der Neurologie* contains contributions from his pen, and in the *Handbuch der pathologischen Anatomie des Nervensystems* of 1904, there appeared his study of the diseases of the medulla oblongata and of the pons. In 1920 he published a discussion of diseases of the spinal cord and peripheral nerves in the *Diagnostische und therapeutische Irrtümer of Schwalb,* in which his skill as a diagnostician reveals itself.

He published two monographs also in coöperation with Oppenheim, and since the latter's death Cassirer has revised Oppenheim's *Lehrbuch der Nervenkrankheiten* (1923), in which he gave of his own rich material in the fields in which he excelled, angio- and tropho-neuroses, brain tumors, peripheral paralyses, diffuse diseases of the spinal cord.

JOHN NEWPORT LANGLEY (1852–1925), M.A., M.D., LL.D., F.R.S.

The news of Professor Langley's death on November 5 will be received with deep regret by physiologists and neurologists in all

parts of the world. In his long service as Professor of Physiology in Cambridge he had become to many something of an institution. John Newport Langley, the second son of John Langley and Mary, eldest daughter of Richard Groom, was born on November 10, 1852. Educated at Exeter Grammar School and in private hands, he became a scholar at St. Johns College, Cambridge, and received his degree in 1874 with first class honors in the Natural Science Tripos. Some time later he became a Fellow of Trinity College and held the post of University Lecturer from 1884 to 1903, when he succeeded Sir Michael Foster as Professor of Physiology. He edited the *Journal of Physiology* with Foster after 1894, and became sole editor in 1906–07 just before Foster's death (1907). In 1902 he married Vera Kathleen, daughter of Frederick G. Forsyth-Grant of Ecclesgreig, Kincardineshire.

Langley commenced his scientific investigations early in life, one of his early publications, probably his first, being published in 1878, the year of Claude Bernard's death. It was entitled "The Influence of the Chorda Tympani and Sympathetic Nerves upon the Secretion of the Submaxillary Gland" (*Journ. Physiol.*, Vol. 1, pp. 98–103). In this contribution he confirmed and amplified Ludwig's observation (1851) that the secretion of the salivary glands differed with the nerve stimulated, being thick and viscid with sympathetic stimulation and watery with stimulation of the chorda. This early investigation laid the foundation for a large number of subsequent researches in which the cell changes during pancreatic, salivary, liver, and gastric secretion were studied in detail. In 1881 his interest was aroused at the International Physiological Congress by Professor Goltz' decorticated dogs, and he in association with C. S. Sherrington later examined the brains of these creatures which had been sent by Goltz. Several papers by Langley on the topography of the brain appeared in the *Journal of Physiology* in 1883, and the important paper with Sherrington on the "Secondary Degeneration of Nerve Tracts Following Removal of the Cortex of the Cerebrum in a Dog" appeared in the following year (*Journ. Physiol.*, Vol. 5, p. 49, 1884). This paper was one of the earliest in which the problem of secondary degeneration of the pyramidal tracts was studied with modern technique.

Langley's outstanding contribution to the science of physiology lay in his elucidation and systematization of the anatomy and physiology of the autonomic nervous system. He based his generalizations largely upon the important histological results of Gaskell (1886) who had defined the limits of the sympathetic system and had pointed out the significance of the grey and white rami communicantes. Under the stimulating influence of his teacher, Sir Michael Foster, Langley set himself the problem of working out in detail the physiological significance of Gaskell's anatomical results, and this turned out to be his life's work—a work, be it said, to which he applied himself unremittingly for forty years. In 1889 he found in association with W. Lee Dickinson that nicotine caused local paralysis when applied to sympathetic ganglia, owing presumably to blockading

at the "synapse"—the union between nerve cells which had lately been given a name by Sir Michael Foster. This was followed by a highly important series of experiments which overthrew many of the current conceptions concerning the involuntary nervous system, and established that the tectal and bulbo-sacral outflow differed in their origin from the sympathetic or thoracico-lumbar outflow in that the latter had its nerve cell stations in the sympathetic ganglionated chain, while the former to which the name "parasympathetic" was subsequently applied, had its cell stations peripherally in the tissue which it innervated. To the two systems he gave the name of the "Autonomic." The outcome of these investigations was summarized in Langley's admirable chapter on the sympathetic nervous system in Schäfer's Text-Book of Physiology (1900, Vol. 2, pp. 616–696). To this Text-Book he also contributed the chapter on the Salivary Glands.

In 1906 he published his important investigation "On Nerve Endings and on Special Excitable Substances in Cells" (Proc. Roy. Soc., Vol. 78B, p. 170), the outcome of which was the enunciation of the theory of Receptive Substances. He found that nicotine and certain other drugs when applied to the region of the nerve ending caused muscle twitching, but when applied to a non-neural portion twitching did not occur. This led to the inference that there exists in the region of the motor end-plate certain specialized substances which serve to transmit the motor nerve impulse across the neuromuscular junction. The solution of the problem of receptive substances cannot be regarded as settled. To Langley is due the credit of having first described this phenomenon, which, however, has not yet found an adequate explanation. His discovery of the antagonism between curari and nicotine (1906) (the mechanism of which was subsequently worked out by Lapicque) was an important outcome of his investigations on receptive substances.

There followed from Langley's pen during the next ten years a number of other contributions on receptive substances and also the results of further investigations upon local application of nicotine to ganglion cells (*Journ. Physiol.*, Vol. 43, p. 125, 1911). In 1921 he published the first part of a monograph on the Autonomic Nervous System, and some time ago it was announced that Part 2 would soon appear. It is to be hoped that the preparation of Part 2 was complete before his death. Langley's thorough familiarity with the innervation of skeletal muscle led him to be sceptical of the recent investigations in Holland and Australia on the alleged sympathetic innervation of striated muscle, and he took advantage of several opportunities to point out the unsatisfactory nature of the evidence which had been adduced and of the fallacies in the arguments which had been used to establish the theory of sympathetic innervation of tonic reactions (*Naturwissenschaften,* Bd. 10, p. 829, 1922). The problem of vasomotor control attracted his attention many times during his life, and in the last few years he made it the subject of several important investigations. He studied among other things the effect of local application of strychnine to the vasomotor centers ("Vaso-

motor Centres, Part III. Spinal Vascular (and other Autonomic) Reflexes and the Effect of Strychnine on Them"; *Journ. Physiol.*, Vol. 59, pp. 231–258, 1924). At the meeting of the Physiological Society in 1924 he described certain phenomena relating to antidromic conduction in the cat's paw. He presided at the meeting of the Physiological Society in Cambridge in 1925 and brought forward a communication on "Vascular Reflexes, Chiefly in the Ear of the Rabbit" (Proc. Physiol. Soc., May 30, 1925; *Journ. Physiol.*, Vol. 60, p. xvii).

Langley received many honors in the course of his life (see the Year Book of the Royal Society). He was made a Fellow of the Royal Society on June 7, 1883, following the publication of his papers on the brains of Goltz's dogs. In 1893 he was President of the Neurological Society of Great Britain. On April 5, 1900, he was made a member of the Philosophical Club of the Royal Society. He served on the Council of the Royal Society in 1897–98 and 1904–05, and was Vice-President of that body in 1904–05. He received the Royal Medal in 1892, the Baly Medal of the Royal College of Physicians in 1903, and in 1912 the Andreas Retzius Medal of the Swedish Society of Physiologists. Of his many honorary degrees that of LL.D. from St. Andrews is perhaps the most noteworthy.

Though Langley was not essentially a "creator" his contribution to knowledge was singularly rich by dint of constant application and sound judgment. Personally Langley was extremely retiring and his intimate friends were few. He was ever immaculate in appearance, and it has been playfully said of him that in this respect he offered a great contrast to his physiological brethren. He was a man of hobbies; among other things he was particularly fond of skating and gardening. The latter interest he probably derived from his master, Sir Michael Foster. As editor of the *Journal of Physiology,* he was conservative and from him many contributors learned the hard lesson of brevity and clearness. He was kind-hearted, and many American students recall with deep apprecation his generosity and kindly interest. Throughout his life he adhered to the belief that physiology was a science of accurate observation, and he frequently expressed scorn for those who trusted to their instruments rather than their five senses.

Dr. John Fulton, Boston

Notes and News

PROFESSOR BECHTEREW OF LENINGRAD; IN COMMEMORATION OF HIS 40TH YEAR OF MEDICAL ACTIVITIES. JUBILEE HELD DECEMBER 20, 1925

W. M. Bechterew. A Sketch of His Scientific Life

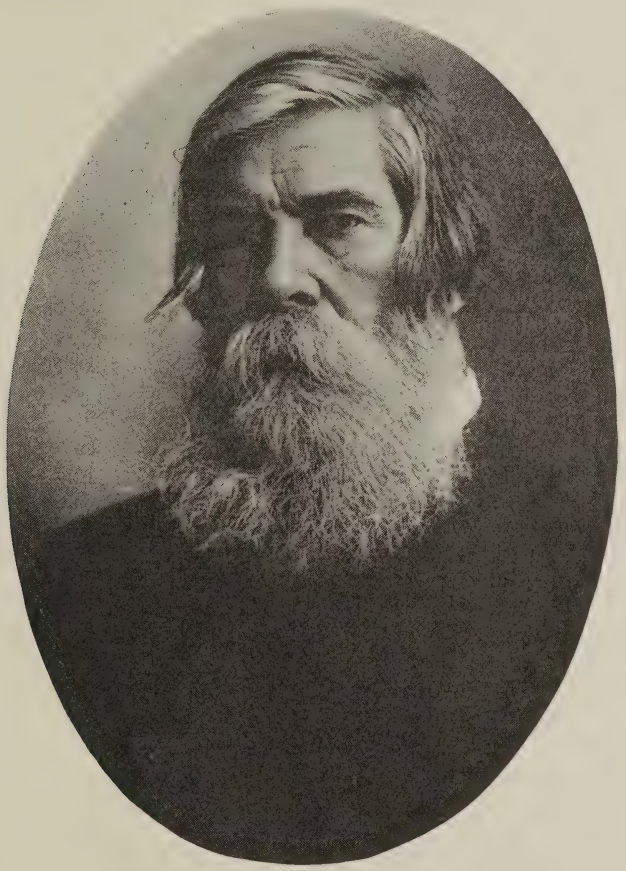
Wladimir Mikhailovich Bechterew, a native of province of Viatka, county of Yelabug, Russia, was born in 1857. He attended the gymnasium (classical academy) of Viatka and at the age of sixteen entered the Medico-Chirurgical (later known as Military-Medical) Academy of St. Petersburg. Graduated with high honors in 1878 he was assigned for special research work in mental and nervous diseases, first under Professor Balinsky and later under Professor Merjeievsky. In 1881 Bechterew defended a thesis: "Temperature Changes in Insane," was appointed privat-dozent of nervous and mental diseases and a lecturer on diagnosis of nervous diseases. During the following three years he published 58 scientific papers on various topics. In 1884 he was commissioned by the government abroad for research studies which he pursued in Berlin under Westphal and Mendel, in Leipzig under Flechsig, Wundt and Hauch, and in Paris under Charcot.

While still abroad he was elected in 1886 professor of psychiatry and neurology of the University of Kazan, where he vigorously continued his researches. In 1893 he was transferred to the Military Medical Academy, St. Petersburg. As head of the department of nervous and mental diseases he bent all his energies toward amelioration of the care and treatment of the insane. His clinical department became the center of scientific activity and the birthplace of a large number of teachers, physicians, psychiatrists and neurologists, scattered throughout Russia. Under Bechterew's supervision, numerous theses and original contributions have been written, and himself he published his world wide famous works, such as "Conducting Pathways of the Brain and Spinal Cord," "Physiology of Nerve-centers," "Diagnosis of Nervous Diseases" and many minor contributions on psychoneurologic problems.

Bechterew is to be largely credited with the creation of objective psychology which later as Reflexology opened up new principles for

the study of a healthy and diseased personality. To this new field Bechterew contributed a series of important treatises: "Psyche and Life"; "Objective Psychology"; "General Principles of Human Reflexology"; "Collective Reflexology."

In his "objective" research studies Bechterew came in contact



with pedology problems, and in the Pedologic Institute which he organized originated the so-called genetic reflexology which plays so important a rôle in the studies of child development.

A number of contributions were made by Bechterew to scientific study of the problems pertaining to hypnosis, suggestion and psychotherapy.

Even as a young professor Bechterew showed great abilities as an organizer. Thus, he establishes in Kazan a psychologic labora-

tory; organizes a society of neurologists and psychiatrists and founds a periodical, "Neurological Messenger."

In St. Petersburg Bechterew's clinical service becomes the center of all the neurologic and psychiatric societies of the Russian capital and a new periodical is created—"Review of Psychiatry."

In 1908 Bechterew founded the Psycho-Neurologic Institute, an institution of high learning and research. Here was organized the first antialcoholic institute of Russia which at the Paris international antialcoholic congress has been recognized of world wide importance. Since the days of the revolution, the Psycho-Neurologic Institute branched off, under Bechterew's guidance, into a number of independent institutions: (1) Institute of Medical Sciences; (2) Institute for Brain Research; (3) Pathologo-reflexologic Institute, with a department for drug addicts; (4) Clinico-educational Institute for Nervous Children; (5) Chemico-pharmaceutical Institute; (6) Otophonetic Institute, and (7) Danish Research Institute. The nucleus of the Psycho-Neurologic Institute was transformed into a Psycho-Neurologic Academy with Bechterew as president.

During the 40 years of his activity as teacher, Bechterew published about 500 contributions to science and had more than 5,000 pupils of which many are university professors.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

Vol. 63 FEBRUARY, 1926 No. 2

The Journal

OF

Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

Original Articles

THE PUPILS IN SOMATIC AND VISCERAL DISORDERS IN ASSOCIATION WITH REFERRED PAIN AND HYPERALGESIA

Joseph Byrne, A.M., M.D., LL.D.

DEPARTMENT OF BIOLOGY, FORDHAM UNIVERSITY; CONSULTING NEUROLOGIST, FORDHAM DIVISION, BELLEVUE AND ALLIED HOSPITALS; ATTENDING NEUROLOGIST, NEUROLOGICAL HOSPITAL, WELFARE ISLAND; NEW YORK CITY

To-day the aim of the diagnostician is to obtain as close an insight as possible into the nature, extent and significance of derangements in the *living* patient. In this respect modern medicine is distinctly dynamic in contrast to the medicine of the era just passed which was largely static in so far as its interpretation of disease symptoms rested upon post-mortem findings and reports. Without ignoring or detracting from the great value of these findings the clinician of to-day endeavors to interpret the symptoms and signs of disease in terms of disordered physiological mechanisms, all of which presupposes familiarity with the normal mechanisms and by these we understand the anatomical parts that enter into a reaction and the rôle played by such parts in that reaction.

Mechanistic interpretation of disease manifestations implies, therefore, first of all a practical knowledge of the normal physiological mechanisms. Without according this the place of first importance the dynamic concept is mere futility. In the past the study of the pupillary changes, and of the pain and hyperalgesia incidental to somatic and visceral disease, has been seriously handicapped by lack of knowledge of the normal mechanisms of pupillary alterations and of pain and tenderness. Without a knowledge of the neural mechanisms involved it is not surprising that many of the pupillary and

painful phenomena attending disease have hitherto had little more than transitory academic interest for the internist and general practitioner.

PHOTOGRAPH 1. Pseudo-paradoxical phenomenon (positive phase) in left pupil three days after acupuncture of anterior (left) wall of stomach.

PHOTOGRAPH 2. Pseudo-paradoxical phenomenon (negative phase) in right pupil seven days after acupuncture of right lung.

In previous contributions the author has shown that on the afferent side the mechanism of pupil dilatation is driven mainly by the affective (pain bearing) system (1) of nerves whereas the

mechanism of pupil constriction is driven mainly by the critical (proprioceptive) system.(2) In normal sleep the pupils are constricted

PHOTOGRAPH 3. Pseudo-paradoxical phenomenon (positive phase) in right pupil seven days after acupuncture of right ventricle of heart.

PHOTOGRAPH 4. Subpericardial hemorrhage after successful acupuncture (from without) confined to the left ventricle. In this animal the left pupil exhibited both phases of the pseudo-paradoxical phenomenon.

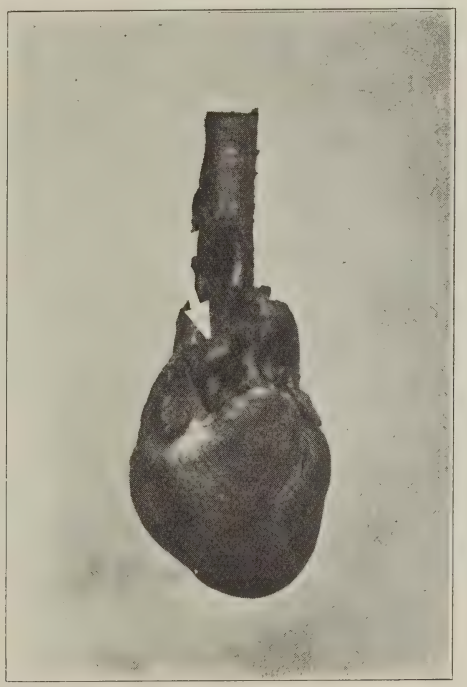
and as function is largely in abeyance in both systems of peripheral afferent nerves during deep sleep the pupil constriction is perhaps

to be accounted for by the inherent preponderance of power (tonus) in the constrictor mechanism. Compare Parsons.(3) On awaking, *e.g.*, from profound ether narcosis the effect of the inrush of affective impulses is seen in the marked pupillary dilatation which soon gives place to a noticeable degree of constriction as soon as the animal becomes fully conscious and begins to focus the eyes upon objects. Normally the size and equality of the pupils are regulated by a nicely balanced flow of afferent dilator (affective) and constrictor (critical) impulses.

PHOTOGRAPH 5. Pseudo-paradoxical phenomenon (positive phase) in left pupil ten days after acupuncture of arch of aorta.

The current textbook conception as to the course which these two sets of impulses follow needs revision in the light of recent observations. In his experimental studies the author found that after lesions of the peripheral somatic nerves (sciatic, brachial plexus, etc.) two striking phenomena, viz., true paradoxical dilatation (4) and pseudo-paradoxical dilatation (1) might be observed in the pupil having preponderate functional relations with the injured nerves. Both phenomena occur in the homolateral eye after unilateral lesions of the peripheral nerves (skin, muscle, etc.) *above* the level of the umbilicus whereas they occur in the contralateral pupil after lesions *below* that level. Compare Byrne and Einthoven.(5) In his later studies the author found that lesions causing paradoxical pupil constriction (2) followed the same rule. For various reasons the phenomenon to which the author gave the name *pseudo-paradoxical* has at the present writing far more importance for the clinician than the

true paradoxical phenomenon. The latter requires special means of elicitation, *e.g.*, hypodermic or intravenous injection of adrenalin, etc., and generally it can be elicited only after a period of incubation which averages from eight to twelve days after lesions below the umbilicus and five to eight days after lesions above that level. On the other hand the pseudo-paradoxical phenomenon has no period of incubation and may be seen within twenty-four hours after the lesion and for weeks



PHOTOGRAPH 6. Lesion after successful acupuncture of arch of aorta; this animal exhibited in left pupil both phases of the pseudo-paradoxical phenomenon.

thereafter although it is likely to diminish or even disappear altogether during the period in which true paradoxical dilatation can be elicited, *i.e.*, from about the eighth to the fifteenth day. During or immediately after lesions such as moderately crushing one sciatic nerve, the contralateral may be the larger pupil but a few hours later, when the effects of the injury stimulus have passed off, the contralateral will be found to be the smaller pupil if the animal be absolutely quiet and untouched. On the slightest excitement, however, such as touching, hurting or frightening the animal, the contralateral becomes at once the larger pupil. This is the pseudo-paradoxical phenomenon which

resembles the true paradoxical but which, in its most characteristic part, viz., the dilatation, has a mechanism altogether different from that of true paradoxical dilatation. Hence the name pseudo-paradoxical. In the instance given the diminution in size of the contralateral pupil when the animal is quiet is accounted for by diminished inflow of dilator (affective) impulses as the result of functional impairment, in the bodies mostly, of the primary affective neurones (axonal reaction phenomena) more seriously involved in the operative lesion whereas the dilatation upon excitement or painful stimulation results from overdischarge of the less seriously injured (overstimulated)

PHOTOGRAPH 7. True paradoxical phenomena in left eye eight days after crushing left testis proper without injury of the epididymis.

primary affective neurones. The mode of observing the phenomenon is of importance to the clinician since in somatic or visceral disease it is often possible to elicit the dilatation component in a quiescent patient by pressure upon the diseased part in trunk or limb or upon the disordered viscus, *e.g.*, testis, epididymis, ovary, uterine tube, etc.

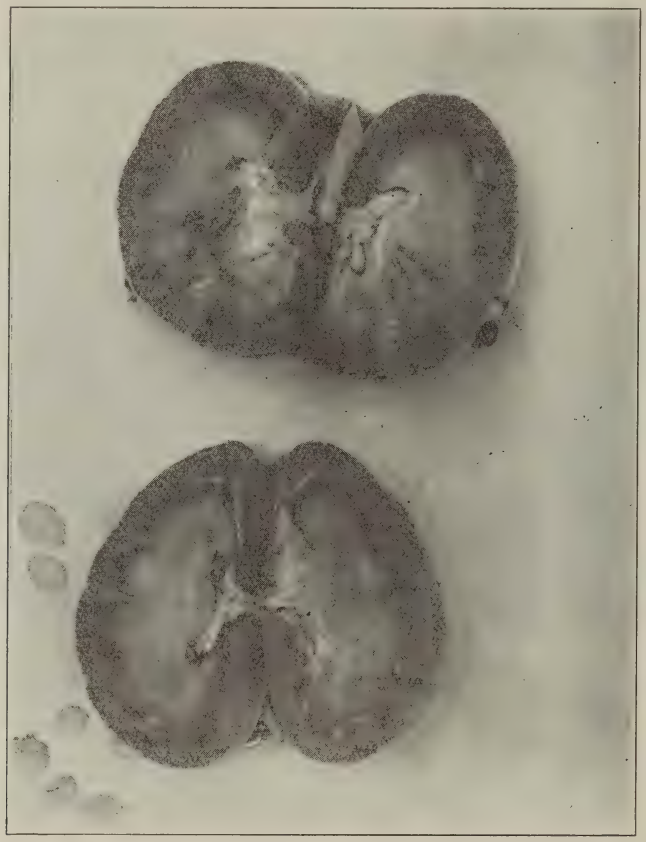
Although pupil inequality had been previously observed in connection with visceral lesions, in the author's knowledge no attempt has hitherto been made to determine experimentally or clinically the nature and mechanism of the pupillary changes. After experimental lesions of the various viscera the author found that the determining factor as to which eye would exhibit the pseudo-paradoxical prenomenon was the primitive derivation of the cerebrospinal afferent nerve supply of the organ injured. Viscera developed from germ buds springing preponderately from the right or left side of the primitive gut derive their afferent supply from nerves that pre-

ponderately enter the right or left side respectively of the spinal cord. It may be stated in general that lesions of one lung, kidney, ovary or testis, and unilateral lesions of such viscera as remain tubular (heart, great vessels, gastrointestinal tract) induces the pseudo-paradoxical phenomenon in the homolateral pupil when the organ injured receives its afferent supply through nerves that originally took origin preponderately from segments above the tenth thoracic whereas the phenomenon occurs in the contralateral eye where the injured organ derived its original afferent supply through nerves that preponderately entered the cord below that level. This is complementary of the rule found to obtain in somatic lesions.

PHOTOGRAPH 8. Pseudo-paradoxical phenomenon (positive phase) in left pupil seven days after acupuncture (from without) of right kidney.

In studying the effects of visceral lesions upon the pupil dilator mechanism the author also tried to determine whether such lesions were accompanied by reflected hyperalgesia. In animals carefully selected as to temperament, etc., it was possible, by means of measured superficial and deep affective stimuli, to map out areas of hyperalgesia which roughly coincided with the areas found in the human subject. The occurrence in animals, after circumscribed visceral lesions, of more or less well defined areas of cutaneous and deep hyperalgesia in association with the pseudo-paradoxical pupil phenomenon suggested the possible importance of the findings from the standpoint of diagnosis and the necessity for clinical investigation as to whether in man the pseudo-paradoxical phenomenon occurred in association with somatic lesions and with the pain and somatic

(reflected) hyperalgesia so commonly associated with visceral disorders. As the results appear to corroborate the animal findings it seems that the pseudo-paradoxical phenomenon must be regarded as an important physical sign of painful lesions, somatic or visceral, and that, taken in conjunction with reflected pain and hyperalgesia, it furnishes a reliable localizing sign of visceral disease.



PHOTOGRAPH 9. After acupuncture (from without) of right (upper) kidney; effects of lesion mainly in the conducting portion; this animal exhibited typical true and pseudo-paradoxical phenomena in the left eye.

Following the lead of Bassereau (1847), Beau (1866) and Lange on the continent the work of Ross,(6) Mackenzie (7) and Head (8) securely established the fact that visceral disorders were frequently associated with somatic pain and cutaneous hyperalgesia. But notwithstanding the great importance of this fact from the standpoint of diagnosis little use has been made of it clinically although such

workers as Head took great pains in attempting to chart accurately the areas related to each viscus.

Clinicians generally have not been able to verify these areas which were frequently found to be present in the absence of demonstrable lesions of the supposedly related viscus and *vice versa.* To the clinical mind something more was necessary in the way of research before the findings of the earlier observers could be regarded as available for general use. That something, in the light of after events, seems to be nothing other than a rational working hypothesis

PHOTOGRAPH 10. Pseudo-paradoxical phenomenon (positive phase) in left pupil fourteen days after crushing of right epididymis.

regarding the mechanism of pain and tenderness (hyperalgesia) in general without which the study and discussions of referred (reflected) pain and hyperalgesia must necessarily seem unprofitable. The author believes he has succeeded in establishing a rational mechanistic hypothesis for pain and tenderness (hyperalgesia) in general (9) and for referred pain. (10) In the near future he expects to publish more detailed studies on the mechanism of somatic pain and hyperalgesia of visceral origin (reflected pain, etc.). For the present he merely wishes to briefly record and discuss some of his experimental and clinical findings in the hope that they may stimulate interest in the neurological aspect of disease and furnish the clinician with practical aid in the diagnosis of visceral disease.

In his experimental studies (11) the author found that after lesions in the following sites the pseudo-paradoxical phenomenon appeared in the *homolateral pupil.* (a) Skin of side of face and head

(crushing). (b) Skin of one side of thorax above level of umbilicus (crushing). (c) Kidney cortex secreting system (acupuncture). (d) Kidney removal as a whole. (e) Anterior (left) wall of stomach (acupuncture). (Photograph 1.) (f) Posterior (right) wall of stomach (crushing). (g) One lung (acupuncture). (Photograph 2.) (h) Right ventricle of heart (acupuncture). (Photograph 3.) (i) Left ventricle of heart (acupuncture). (Photograph 4.) (j) Arch of aorta (left ventricular system). Photographs 5 and 6.) (k) Spleen (acupuncture). (l) Right side of duodenum (crushed).

PHOTOGRAPH 11. Pseudo-paradoxical phenomenon (positive phase) in left pupil seven days after acupuncture of right side of uterus.

(m) Thyroid gland (unilateral crushing). (n) Adrenal gland (acupuncture). (o) Testicle secreting system (acupuncture, crushing). (Photograph 7.) (p) Testicle as a whole (crushed). (q) Ovary secreting system (acupuncture, crushing).

After lesions in the following sites the pseudo-paradoxical phenomenon appeared in the contralateral pupil: (a) Kidney, duct system, *i.e.,* pelvis and ureter (acupuncture, crushing). (Photographs 8 and 9.) (b) Testicle, duct system, *i.e.,* epididymis, etc. (acupuncture, crushing). (Photograph 10.) (c) Uterus or vagina unilateral injury (acupuncture, crushing). (Photograph 11.) (d) Uterine (Fallopian) tube (crushing). (e) Bladder wall unilateral injury (acupuncture, crushing). (f) Appendix caeci, lesion of either side in relation to its mesentery (acupuncture). (g) Whole appendix (crushing). (h) Ileum six inches cephalad of ileo-caecal valve, either side in relation to the mesentery, *i.e.,* assuming the gut were a

straight tube (crushing, acupuncture). (i) Skin of hind quarter anywhere caudad of level of umbilicus (crushing, etc.).

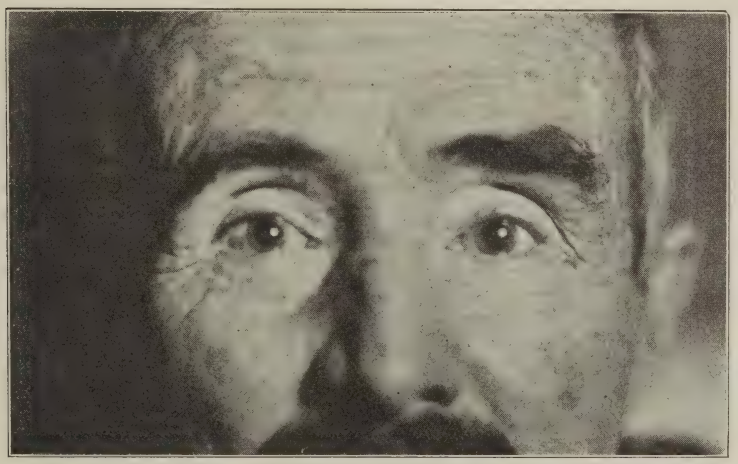
The following lesions gave doubtful, conflicting or negative results: (a) Liver. (b) Gall bladder. (c) Pancreas. (d) Parietal peritoneum, unilateral mechanical injury (scratching) in sub-diaphragmatic and lower left abdominal regions.

The following abstracted cases illustrate the diagnostic significance of the pseudo-paradoxical pupil phenomenon when taken in conjunction with pain and tenderness in somatic lesions and with reflected pain and hyperalgesia in visceral lesions. Where no reference is made to the eye examinations it is understood that the latter revealed no sufficient cause for the pupil inequality.

Somatic Lesions

I. *Laceration of fifth, sixth, and seventh cervical roots.*

T. C., thirty-seven, male. On October 2, 1918, was run down by motor car. Diagnosis contusion (laceration) of left brachial plexus. On January 10, 1919, the motor and sensory signs and reflexes, etc., pointed to lesion of cervi-



Photograph 12. Case I; pseudo-paradoxical phenomenon in left pupil (positive phase) during a paroxysm of pain after lesion of left posterior nerve roots C, V, VI and VII.

cal roots V, VI and VII. From the time of injury the patient had paroxysms of pain focussed in the flexor aspect of the elbow and in the thenar eminence. During these paroxysms the pupils became dilated, the left much more so than the right. Chart 1 shows the area of hyperalgesia for the dragged pin point. Photograph 12 shows the left as the larger pupil during a paroxysm of pain. In the painless intervals the left was the smaller pupil.

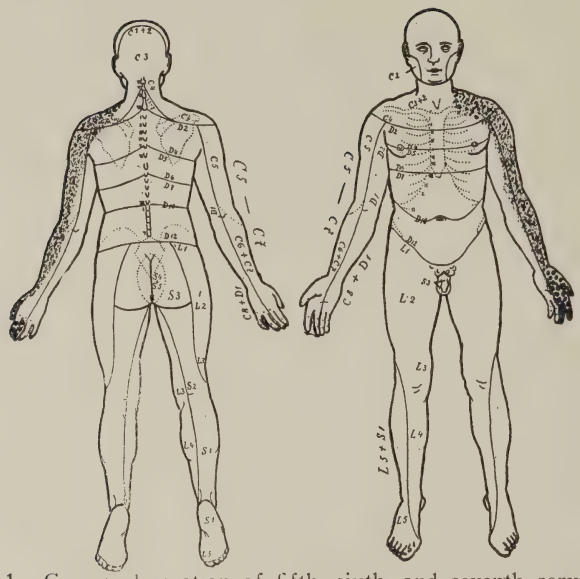
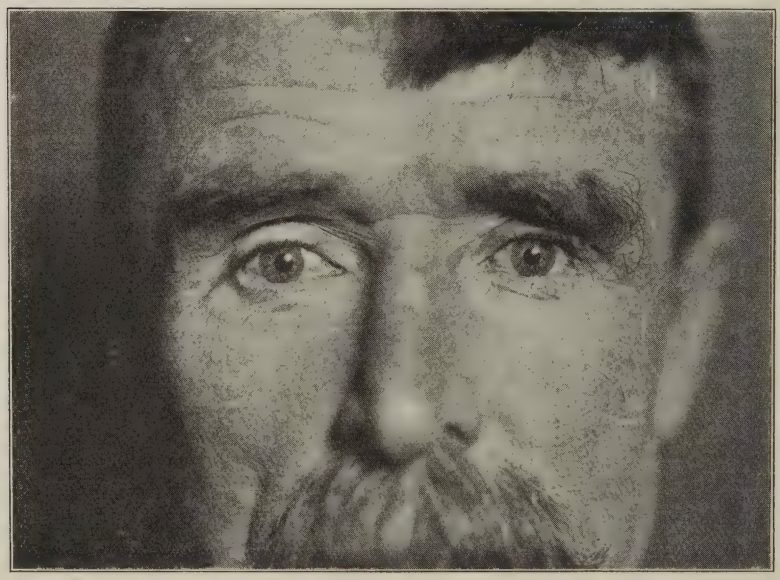


CHART 1. Case I, laceration of fifth, sixth, and seventh cervical roots; *heavy dots* (on hand) extreme, and *light dots* moderate, hyperalgesia.

II. *Contusion (laceration) of left brachial plexus.*

B. T., forty, male. On February 28, 1918, fell down flight of fourteen steps, dislocating left shoulder. Suffered much pain, in the palm of the hand



PHOTOGRAPH 13. Case II; pseudo-paradoxical phenomenon in left pupil (negative phase)—two and one-half years after lesion of the left brachial plexus; some sensory defect but no pain.

chiefly, for months. On August 17, 1918, at the Neurological Institute, Dr. Alfred S. Taylor operated on the shoulder and reduced the dislocation. The pain in the hand, however, persisted. After three operations, one of which consisted of removal of a large section of the sheath of the brachial artery, had failed to give relief it was decided to try injections of a 60 per cent solution of alcohol into the nerve trunks of the forearm. At Fordham Hospital Anthony S. Harrigan made the injections on January 23, 1919. After the injections there were the usual signs of paralysis, etc., and from that time on the patient's condition improved. Throughout his illness the left

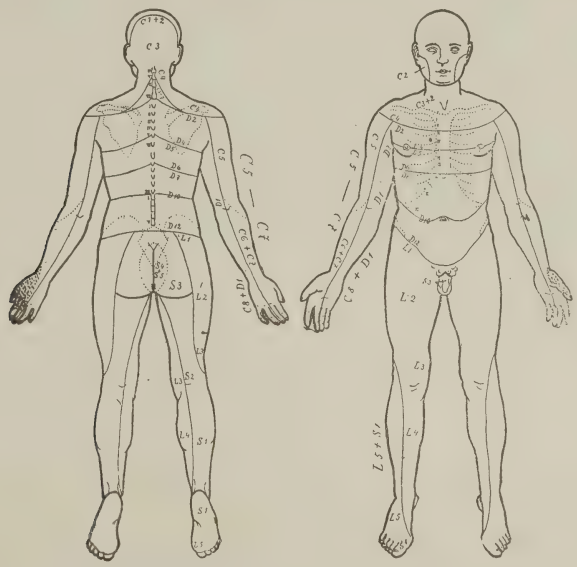


CHART 2. Case II; laceration of brachial plexus; dotted area, sensibility absent for superficial critical and affective elements. See text.

pupil was larger than the right when the patient was actually in pain. On March 19, 1921, long after the pains had ceased to annoy him, the left was the smaller pupil. (Photograph 13.) At this time the hand exhibited good motor function but still showed some sensory defects. Compare Chart 2 in which the dotted area shows absence of sensibility for superficial critical stimuli (the von Frey hairs, cotton, compass points, simultaneously applied) as well as for superficial affective stimuli (pricking with the algesimeter at 30 grammes, 55° C., and ice) in the "radial" area. The ulnar and radial areas exhibited protopathic dissociation of the deep variety, *i.e.,* sensibility was impaired for the deep critical elements but preserved and attended by protopathic characteristics (over-reaction, radiation, etc.) for the affective (hurt) element.

III. *Fracture of left humerus: bone graft.*

H. J., male, twenty. Broke left humerus March 19, 1921. On November 13, 1921, the left pupil was a trace larger than the right. On November 14, bone grafting was done on left humerus. On November 13, 1921, the sensory and motor signs of radial nerve paralysis were present. On Novem-

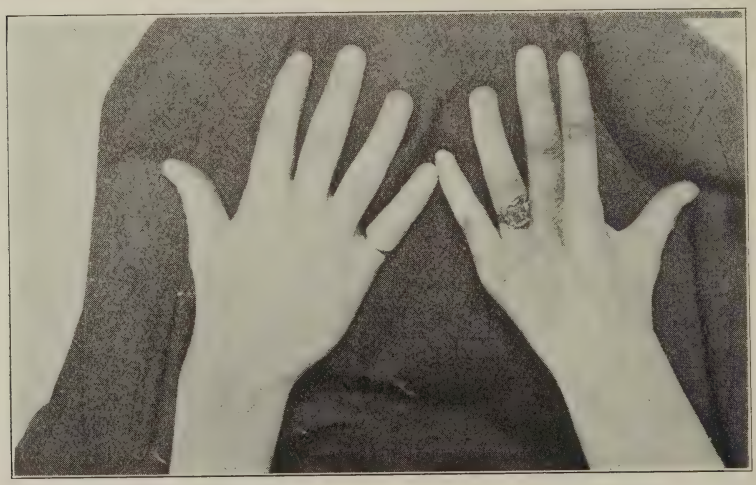
ber 20, 1921, the left pupil was considerably larger than the right when the patient was moved or excited. (Photograph 14.) Similar ocular

PHOTOGRAPH 14. Case III; marked pseudo-paradoxical phenomenon (positive phase) in left pupil six days after bone grafting of left humerus.

phenomena were observed in a young boy suffering from median nerve compression as the result of callus formation after fracture of the radius and ulna in the forearm.

IV. *Delayed ulnar neuritis.*

D. T., male, thirty-one. Received injury at left elbow about fifteen years ago. The present condition of the hand gradually appeared within the last

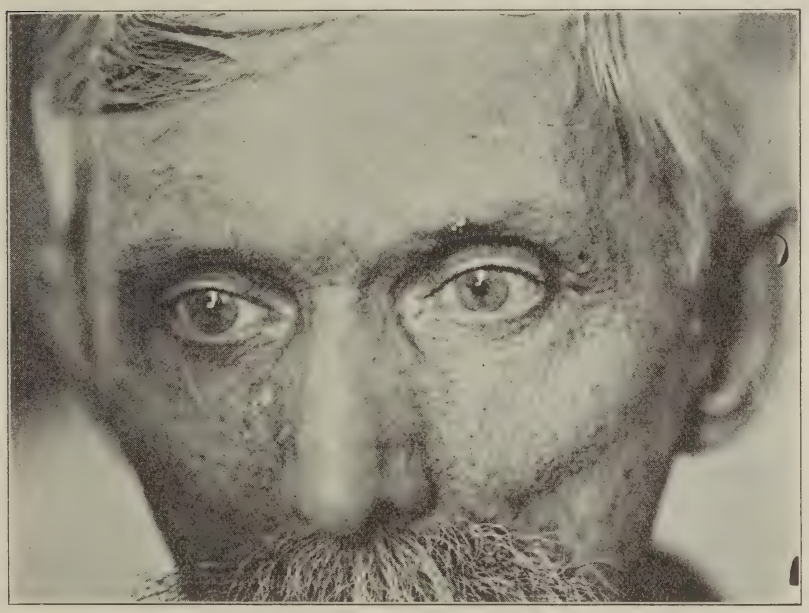


PHOTOGRAPH 15. Case IV; delayed neuritis of left ulnar nerve; patient exhibited pseudo-paradoxical phenomenon (negative phase) in left pupil.

few years. Thickening of the ulnar nerve can be made out by palpation at elbow joint. The motor and sensory signs were those of ulnar palsy. (Photograph 15.) On October 30, 1921, the left was the smaller pupil.

V. *Abscess of dorsum of left foot.*

W. M., sixty-one, male. In association with osteomyelitis of one of the metatarsal bones developed abscess on dorsum of left foot about October 28, 1919. Pupils observed daily over a long period. From time to time the abscess "gathered" and had to be opened. It was noted that when the foot pained him spontaneously the right was the larger pupil, whereas, when the



PHOTOGRAPH 16. Case V; pseudo-paradoxical phenomenon (positive phase) in right pupil from abscess of dorsum of left foot.

foot was merely tender and the patient at rest and without pain, the right was often the smaller pupil. In such conditions painful pressure on the tender foot at once caused the right to become the larger pupil. (Photograph 16.) The ophthalmologist reported vision O. D. $\frac{15}{20}$ O. S. $\frac{15}{30}$ with normal fundus.

VI. *Fracture of tibia and fibula.*

S. W., male, twenty. Fractured both bones of left leg October 18, 1921. On November 1, 1921, as patient was quiescent and without pain, the right was the smaller pupil. In a similar case in which the right leg had been broken twenty-four days previously the left was the smaller pupil.

VII. *Pott's fracture of left leg.*

H. J. H., male, twenty-one. Sustained Pott's fracture of left leg November 6, 1921. On November 13, 1921, the patient resting quietly and without pain, the right was the smaller pupil. (Photograph 17.)

PHOTOGRAPH 17. Case VII; pseudo-paradoxical phenomenon (negative phase) in right pupil seven days after Pott's fracture of left leg.

PHOTOGRAPH 18. Case VIII; pseudo-paradoxical phenomenon (positive phase) in left pupil three days after sustaining Pott's fracture of right leg.

VIII. *Pott's fracture of right leg.*

S. J., male, twenty-three. On November 13, 1921, sustained a Pott's fracture of right leg. The patient had much pain on November 13, when the left was the larger pupil. (Photograph 18.)

IX. *Dislocation of hip.*

T. H., male, twenty-six. Right hip had been dislocated six months previously. At present when the patient is quiet and has no pain the right is the smaller pupil but it immediately becomes larger than the left when the patient attempts to stand or walk. Such attempts always cause considerable pain.

X. *Rupture of left sural (external popliteal) nerve.*

F. M., male, twenty-two. Sustained dislocation of left knee in November, 1918. A primary operation was done upon the nerve. On November 6, 1921, motor and sensory functions were still markedly impaired and the right was the smaller pupil.

XI. *Bullet wound of tibial nerve.*

D. W., male, thirty. Was shot in right leg September 13, 1919. The bullet

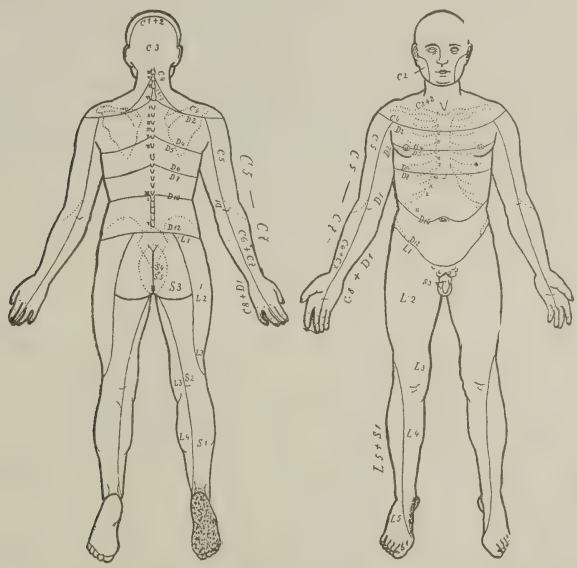


CHART 3. Case XI; bullet wound of tibial nerve; dotted area, in which hyperalgesia, which lasted for several months, represented defective sensibility for superficial critical and superficial affective stimuli.

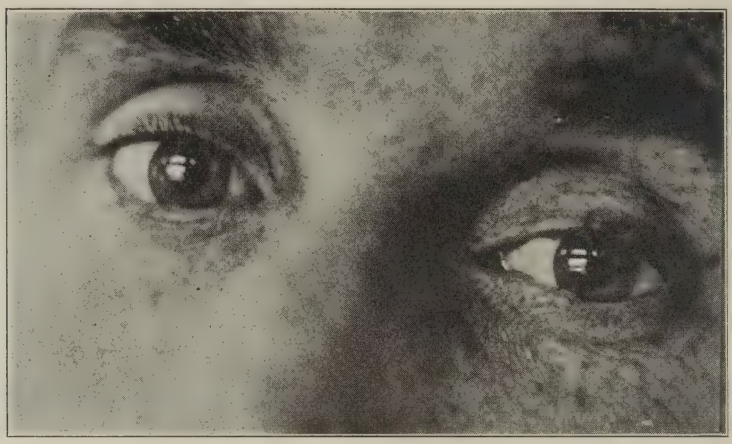
entered the upper third of the thigh and was removed by A. H. Harrigan at the level of the knee. For some time after the operation the patient had dropped foot and intense hyperalgesia (protopathic dissociation) in the region of skin distribution of the tibial nerve. During this period the left was usually the larger pupil. The hyperalgesia cleared up under palliative treatment. In October, 1921, the left was the smaller pupil and the right foot, now no longer markedly hyperalgesic, showed marked sensory impairment (dotted area of Chart 3) for the superficial critical and affective elements.

VISCERAL LESIONS

XII. *Ulcer of anterior wall of stomach.*

B. J., male, thirty. On January 4, 1920, was operated on through a median incision for gastric ulcer. On September 12, 1920, the ulcer became per-

forated. At operation on October 21, 1921, in Fordham Hospital the scar of the perforated ulcer on the anterior gastric wall was found adherent to the anterior abdominal wall. The duodenum was found buried in organized



PHOTOGRAPH 19. Case XII; pseudo-paradoxical phenomenon (positive phase) in left pupil associated with ulcer of anterior (left) wall of stomach.

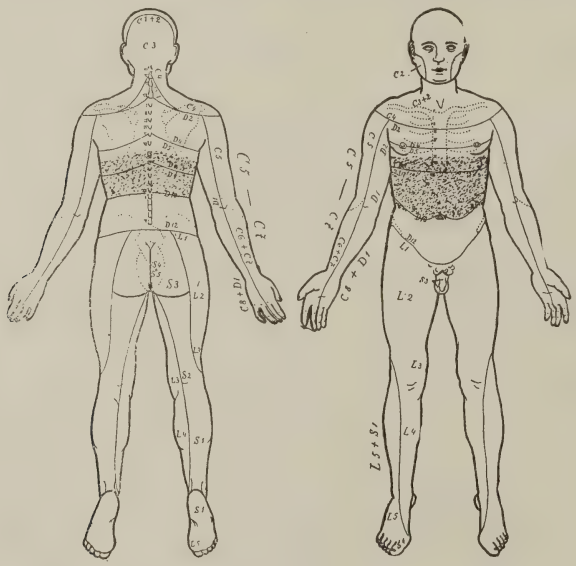


CHART 4. Case XII; ulcer of anterior wall of stomach; dotted area, reflected superficial hyperalgesia.

adhesions. Posterior gastrojejunostomy was performed. On November 1, 1921, the patient was in pain and the left was the larger pupil (5.0:7.0 mm.). (Photograph 19.) Chart 4 shows typical reflected area of superficial hyperalgesia.

XIII. *Cystic ovary.*

S. J., female, forty-five. For many years suffered from premenstrual pain in left lower quadrant of abdomen at each period. When the patient was quiet and free from pain the pupils were equal, or the right was a trace larger than the left; in the presence of her premenstrual pain the left was always the larger pupil. On bimanual vaginal examination the left ovary was found to be enlarged, prolapsed, and tender; pressure upon it caused both pupils to dilate, the left much more so than the right. After vaginal examination when the patient stood up in a suitable light the pupils were equal, or the left a trace smaller than the right and now manual pressure exerted by the patient over

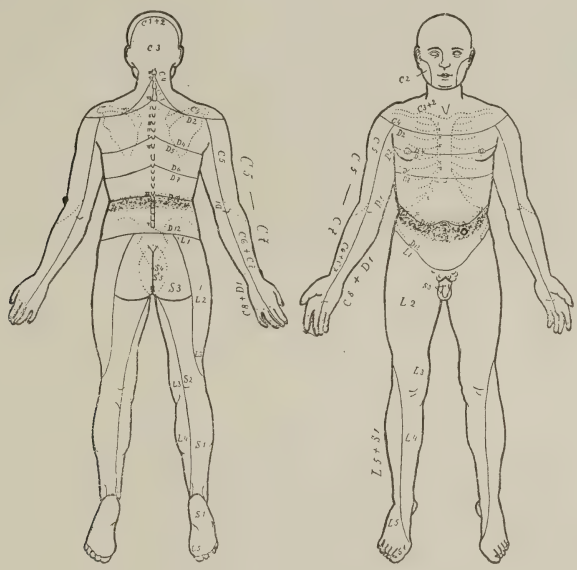


CHART 5. Case XIII; cystic ovary; light dots, area of superficial hyperalgesia; circle, area of deep tenderness (hyperalgesia) where pressure caused the left to become the larger pupil.

the site of her pain caused both pupils to dilate, the left more so than the right. At operation on May 14, 1923, the left ovary was found enlarged; it contained numerous cysts. At this operation the uterus and both tubes and ovaries were removed through a median abdominal incision, a small portion of the right ovary being left behind for endocrine purposes. The patient made an uneventful recovery. On July 3, 1923, the pupils were equal and now pressure over the left lower quadrant no longer caused the familiar pain and although both pupils dilated somewhat they did so equally. Chart 4 shows the area of reflected hyperalgesia for the dragged pin point.

XIV. *Calculus in lower ureter.*

G. M., male, twenty-three. For one week the patient had suffered from malaise and the urine had been dark. Microscopic examination revealed red blood cells but no white blood cells and no epithelial cells. On December 14, 1922, patient had a vague dull, poorly localized pain in the right lumbar region.

Such was the history when patient was seen by the author on December 17, 1922. On examination the right was the larger pupil (6.5:5.0 mm.) and

PHOTOGRAPH 20. Case XIV; pseudo-paradoxical phenomenon (positive phase) in right pupil; calculus in lower left ureter.

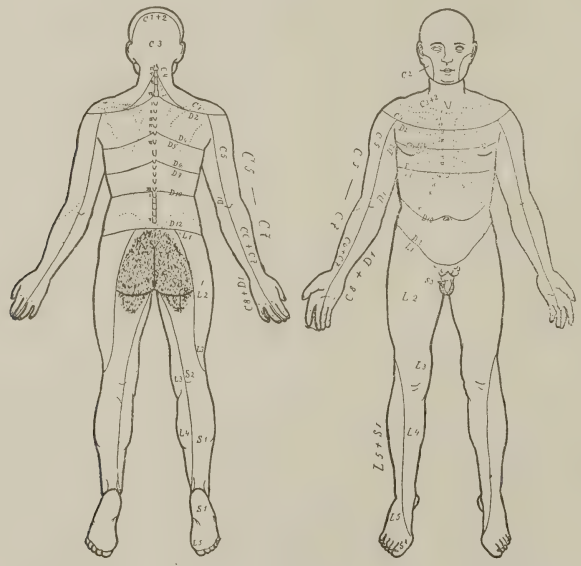


CHART 6. Case XIV; calculus in lower ureter; hyperalgesia on stippled (bladder) area.

typical bladder and prostatic areas of reflected hyperalgesia were present. On the history, the reflected areas of hyperalgesia and the pupils the author was enabled to conclude that a calculus had passed from the kidney on Decem-

ber 14 and had lodged in the left lower ureter. This diagnosis was confirmed soon afterwards by the X-rays. (Photograph 20.) Charts 6 and 7 show areas closely corresponding to typical bladder and prostate areas. On December 28, 1922, the *right* was the smaller pupil and the prostatic area of hyperalgesia had declined in intensity whilst the bladder area had entirely disappeared. This particular calculus had evidently passed into the bladder and was not heard from again.

CHART 7. Case XIV; prostatic area of superficial hyperalgesia; calculus in left lower ureter.

XV. *High congenital implantation of ureter with hydronephrosis; catheterization of ureters; operation.*

T. E. P., male, forty. Patient's appendix had been removed about one year previous to the onset of his attacks of blocking of the right ureter. These attacks, which recurred about every three weeks, were initiated by a chill or chilliness with which was associated constipation and weakness and aching in the anterior aspect of the thighs. The chill was followed for some days by a moderately high fever which subsided with the reëstablishment of kidney drainage when pus was passed in the urine for several days. In these attacks when the patient was in pain the right was the larger pupil (4.5:3 mm.). When, however, he was free from pain and quiescent the right was the smaller pupil but became at once the larger when pressure was made over McBurney's point (right iliac fossa) or over the corresponding point on the left side. This sign was always elicitable during the intervals. During the periods when the bladder was in good condition, and the kidney drainage was good, no well marked areas of reflected hyperalgesia were present but on one or two occasions at the onset of an attack of ureteral blocking a fairly typical kidney (secreting and duct portions) area was present. (Chart 8.) At Roosevelt Hospital, on December 17, 1923, in the presence of the author, E. F. Kilbane passed ureteral catheters up to the kidney pelvis. During the passage of the cytoscope the pupils were equally affected but the moment the catheter entered the ureter the contralateral pupil became much larger than its fellow. Upon entering the left pelvis the homolateral pupil became much larger than its fellow. On the right side it was found impossible to get the

catheter into the kidney pelvis and such failure was distinctly noticeable in the behavior of the pupils, the homolateral pupil failing to become larger than its fellow. Dr. Charles H. Peck resected the renal pelvis and by means of a metal tube, passed through the kidney cortex, temporarily splinted the ureter to secure patency. Excellent recovery.

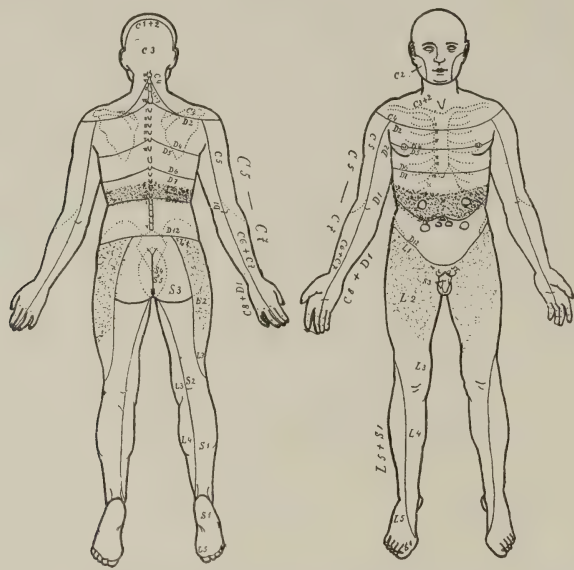


CHART 8. Case XV; hydronephrosis; stippled areas, superficial hyperalgesia; circles, tenderness to pressure (deep palpation).

XVI. *Traumatic epididymitis.*

H. P., male, fifty. On December 28, 1922, patient had a fall, injuring the right testicle. A little later he noticed that the injured testicle was somewhat swollen and tender. On January 7, 1923, the right epididymis was found enlarged and tender and marked hyperalgesia for the dragged pin point was present on the scrotum, perineum, under surface of the penis, and on the glans penis (prostatic area) like that represented in Chart 7 but without the area on the buttocks (bladder area). When the patient was quiet the right pupil was equal to or a trace larger than the left but upon squeezing the right testicle (epididymis) the left became at once the larger pupil.

XVII. *Acute epididymo-orchitis.*

L. McC., male, twenty-one years. Gonorrheal discharge appeared four days after coitus. He was treated with deep urethral injections and internal medication. The right testicle became painful and began to swell thirty-one days after the appearance of the urethral discharge. On examination on the thirty-sixth day of the disease the right testicle was enlarged and exceedingly tender. With the patient standing erect the right was the larger pupil (6.0:5.0 mm.). On lying down the pupils were equal at 5.5 mm. Squeezing the epididymis, with patient in the erect or recumbent posture, caused the left to become the larger pupil (6.5:7.5 mm.), whereas with the patient in recumbency squeezing the testis proper caused the right to become the larger pupil.

Besides the pupil inequality the patient exhibited areas of superficial hyperalgesia corresponding to the eleventh and twelfth thoracic areas in addition to the typical bladder and prostatic areas exhibited in Charts 6 and 7.

XVIII. *Cardio-aortic disease with anginoid attacks.*

O. J., male, sixty. Chief complaint: pain at ensiform cartilage radiating up to the manubrium and towards the cardiac apex and down the arms. In Chart 9 plain circles represent the site of the main pain and the areas into which it radiated. For the past eight months these pains were induced by exertion (walking fast) or eating a heavy meal. During the attacks, which

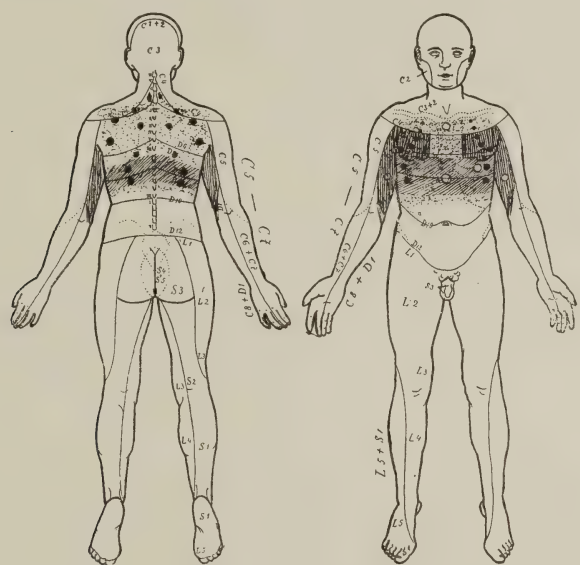


CHART 9. Case XVIII; cardio-aortic disease with anginoid attacks; circles, site of radiation of spontaneous pain which occurred in the circle over the xphoid cartilage; vertical linear shading, intense superficial hyperalgesia; oblique linear shading, less intense superficial hyperalgesia; light stippling, moderate superficial hyperalgesia; heavy dots, areas of deep hyperalgesia; the size of the spots roughly represents the degree of tenderness (hyperalgesia).

last "about half an hour" and which seem to "catch the breath," the patient is forced to stand still. The areas of hyperalgesia found just after an attack are set forth in Chart 9. In the presence of an attack and for a short time thereafter the left was the larger pupil. In the intervals between attacks the left was the smaller pupil. In several other patients suffering from angina pectoris similar phenomena were observed.

DISCUSSION

The dilatation (positive) phase of the pseudo-paradoxical phenomenon as well as the pain and hyperalgesia which occur in association with somatic or visceral lesions are the immediate results of hyperfunctioning of the primary affective neurones supplying the

injured part or viscus. This has been experimentally established for the pseudo-paradoxical dilatation since the pupil inequality found after section of one sciatic nerve was completely abolished only by spinal cord transection in the upper lumbar region, *i.e.*, just above the upper limit of entrance of the sciatic pathways into the cord.(1) As the mechanisms of reflected pain and hyperalgesia are discussed at length in a contribution to appear shortly no more need be said concerning them for the present.

It will be noted that the pupillary changes reported in the clinical cases are practically identical with those found in the animals subjected to experimental somatic (1) and visceral lesions.(11) For general clinical work some knowledge of the location and boundaries of the areas of reflected hyperalgesia is a prerequisite. Previous observers have, however, failed to take into full account the four subdivisions of the peripheral nerves (9) (10) and the important functional relations which each critical set bears to its corresponding affective set. Because of this oversight the deep somatic (other than cutaneous) hyperalgesia which accompanies visceral disturbances has been largely overlooked. The usual mode of eliciting the superficial form of hyperalgesia is by superficial pinching or by lightly dragging a pin point at the proper angle over the skin surface from healthy to affected areas.

The author's mode of eliciting deep hyperalgesia is by deep pinching of the soft parts or by pressure with the pulp of the index or middle finger in regions where bony or hard structures offer counter-resistance. It is advisable to make the tests for superficial hyperalgesia before and after palpating the viscera, and before and after testing for deep hyperalgesia, as these procedures always tend to induce superficial hyperalgesia or to enhance it where it is already present. On the thorax the deep hyperalgesic areas usually make their appearance in visceral disease in advance of the superficial and they can be elicited long after the hyperalgesia for the dragged pin point or for superficial pinching has disappeared. Compare chart 9. The deep hyperalgesia areas themselves are often latent and are demonstrable only after the deep affective neurones have been roused to activity. This is done by deep pinching or by deep digital pressure with slight manipulation or rolling of the structures between the finger tip and the underlying resisting parts. After such manipulations, *e.g.*, upon the left side, it will often be found, especially in persons of middle or advanced age, that the deep areas previously absent (latent) for ordinary tests are markedly in evidence not only upon the side manipulated but

also upon the opposite, unmanipulated side. After such rousing it is also found that areas of superficial hyperalgesia which had been previously absent or feebly in evidence are markedly in evidence if not over whole areas at least over their maxima. As hyperalgesia reflected from the thoracic and abdominal viscera is always bilateral the appearance of the hyperalgesia on the two sides of the body, after rousing manipulations made only on one side, indicates that the deep hyperalgesic areas are to some extent of visceral origin often perhaps, especially in persons at or beyond middle age, dormant leftovers from old visceral lesions.

Areas of deep hyperalgesia may be encountered on almost any portion of the thorax but they are most usually found in the following regions: (a) In the vicinity of a line drawn from the middle of the clavicle through the nipple. (b) In the vicinity of the anterior, posterior or mid-axillary line. (c) About a vertical line running through the lower angle of the scapula with the patient standing erect and the arms hanging by the side. (d) At the chondrosternal junctions especially where the cartilages of the eighth, ninth and tenth ribs fuse in front in the epigastric region. In any one of these regions the deep areas may be present and partially or completely absent in the other regions. In palpating a disordered viscus it is always desirable to have the patient try to distinguish between the somatic (reflected) pain and that felt in the disordered viscus (local pain) for it will often be found that these two are distinguishable notwithstanding the opinion still held by some authors that the viscera are "not supplied with pain nerves."

It will also often be found that the reflected pain is felt in the vicinity of an area of deep hyperalgesia where no superficial hyperalgesia is demonstrable or is demonstrable only after rousing and then only over the site (maximum) of the area of deep hyperalgesia. It will further often be found that the area of deep hyperalgesia into which the pain is reflected from a viscus does not correspond with, or is some distance removed from, the areas usually set down as being related to this special viscus. Thus pain reflected from the upper ascending and more especially from the transverse colon and stomach may be referred to the left nipple region (thoracic areas V and VI) although pains felt in these areas are most usually reflected from the stomach, lower esophagus or heart. In the light of these facts it is evident that the areas of hyperalgesia as set down by Head (8) need revision and amending.

In utilizing the pseudo-paradoxical phenomenon for diagnostic purposes it is necessary first of all to rule out all possible causes of

the pupil inequality other than the somatic or visceral lesion. To this end errors of refraction and other ocular and neural defects as well as general somatic lesions must, as far as possible, be ruled out. In practice the phenomenon can be readily utilized if the clinician keep in mind the rules governing the site of its incidence according to the site of the lesion. It must also be kept in mind that after any lesion, somatic or visceral, the related pupil is usually smaller (negative phase) than its fellow when the patient is quiescent and not in pain but that it is the larger pupil (positive phase) when the patient is in pain or at once becomes so when painful pressure is made upon the diseased part or viscus. Such reversal whereby, as the result of pain or painful manipulation, the affected pupil from being the smaller becomes larger than its fellow is pathognomonic of the phenomenon. In order to produce the pseudo-paradoxical phenomenon the visceral lesion must be completely or preponderately one-sided. By this is meant, for instance, that a pulmonary lesion must be confined to one lung or one lung must be preponderately affected so as to exhibit the typical homolateral pupillary phenomenon. As lobar pneumonia is usually confined to one lung the phenomenon occurs in the homolateral eye. In forms of pneumonia, however, which affect both lungs the phenomenon will be found in the eye upon the side most involved. In lesions of the stomach and upper intestine the phenomenon is found in the homolateral eye where the lesion is completely or preponderately one-sided with reference to the mesenteric attachment. In the lower gastrointestinal tract and appendix caeci on the other hand the phenomenon occurs in the contralateral eye with reference to the primitive mesenteric attachment. Lesions of the appendix caeci are usually bilateral with reference to the primitive mesenteric attachment and hence the phenomenon may occur in either eye depending upon which side, with reference to the primitive mesenteric attachment, is preponderately affected. In appendicitis after rupture the phenomenon may be altogether absent. In accordance with the old clinical rule that congenital cardiac lesions occur mainly upon the right side of the organ, whereas post-natal (acquired) lesions occur mainly upon the left side, it will be found that in most cases of disease of the heart and great vessels as encountered in the adult the ocular phenomenon occurs in the left eye. Compare case XVIII. The aorta, it will be remembered, as well as the left ventricle are derived preponderately from the branchial arches of the left side whereas the pulmonary artery and the ductus arteriosus are derived mainly from the branchial arches on the right side. All this presumably implies that in the first instance the left ven-

tricular system received its afferent supply through nerves that preponderately entered the left side of the spinal cord whereas the right ventricular system received its afferent supply through nerves that preponderately entered the right side of the cord. The kidney, testicle and uterine adnexa (ovary and uterine tube) have a double afferent nerve supply, that to the secreting portion (kidney cortex, testis proper, and ovary) being derived in the first instance from nerves that for the most part entered the spinal cord above the tenth thoracic segment, that to the duct system (ureter and pelvis of kidney, uterine tube, epididymis, ductus deferens, etc.) being derived in the first instance from nerves that entered the spinal cord for the most part below the tenth thoracic segment. In lesions of one of these organs the pupillary phenomenon occurs in either eye depending on whether the lesion completely or preponderately involves the secreting portion or the duct system. In the former case the phenomenon occurs in the homolateral eye, in the latter it occurs in the contralateral eye. Compare cases XIV, XV, XVI and XVII.

In his experimental studies the author found some evidence that the affective nerve supply of the kidney secreting system is much more abundant than that of the duct system; and the same holds true probably for the testis and ovary as compared with their respective duct systems. In the experimental lesions the liver, gall bladader, pancreas and parietal peritoneum gave doubtful or negative results. The author has not had opportunity so far to check up to his satisfaction the clinical findings for these organs. It will be noted that the afferent nerve supply of the viscera as invoked to give a possible explanation for the experimental and clinical facts differs somewhat from that set down in the current text books of anatomy. It must be kept in mind that investigation of the visceral afferent supply is scarcely well under way and at all events is as yet very far from final settlement. The behavior of the pupil after lesions, *e.g.,* of one sciatic nerve, etc., *i.e.,* in sites far removed from the site of emergence of the efferent pupil dilator paths at the level of the upper thoracic segments calls for revaluation of the Dejerine or Klumpke-Dejerine sign which in spinal injuries about the cervico-thoracic junction is supposed to indicate involvement of the efferent pupil dilator paths. In all such injuries the influence of lesions of the afferent paths, *e.g.,* of the brachial plexus, in causing pupil inequality deserve attention which has hitherto been denied them. Compare photographs 12, 13, 14.

The mere incidence of hyperalgesic areas does not necessarily indicate the onset of a serious visceral lesion just as their absence

does not entail the negation of a visceral lesion. It has long been known that focal infections, *e.g.,* in the gums, tonsils, pharynx, cranial sinuses or upper air passages, may be associated with hyperalgesic areas all over the body without any tangible evidence of recent serious visceral involvement; and there can be no doubt that many serious visceral lesions are unattended by marked local somatic hyperalgesia. Perhaps the most striking instance of this latter condition is the acutely inflamed appendix after rupture. From the standpoint of diagnosis the local visceral lesions, uncomplicated by other infections, or by general toxemia from the local lesion itself, furnish the most satisfactory areas of reflected hyperalgesia, *e.g.,* lobar pneumonia or other one-sided lung lesions, acute and chronic appendicitis before rupture, or lesions of one kidney, testicle or ovary. In practical work too much stress should not be laid upon the names and exact boundaries of the areas of superficial hyperalgesia. The deep areas of hyperalgesia will be often found by the clinician to be of more practical importance than the superficial areas because they appear before, and disappear later than, the superficial areas and because the deep affective system of nerves is more essentially and more constantly involved in the mechanism of reflected pain than the superficial system. If the clinician can map out areas roughly corresponding to the superficial areas as charted by Head (12) (13) (14) that is sufficient for practical purposes. On the trunk the complete areas of superficial hyperalgesia so nearly correspond with the areas of root distribution of the thoracic and lumbar nerves that in practice one might consider both sets of areas as coextensive, keeping in mind that the reflected areas must of necessity occur within one or more of the root areas. And should adjoining areas run together this need not confuse the examiner as it is well known that overlapping to a considerable extent occurs in the primitive afferent nerve supply of the viscera. Such overlapping accounts for the rarity of single areas of hyperalgesia associated exclusively with lesions of one organ. The overlapping in question does not relate so much to different nerves supplying the same organ as it does to nerves taking origin about the same segmental level and supplying different organs, *e.g.,* the heart and lungs. Many of the viscera, however, in addition to the ordinary spinal afferent supply, receive an afferent supply through the vagus. This, therefore, constitutes an overlapping afferent supply of another kind which in many cases gives rise to bilateral areas of reflected hyperalgesia, *e.g.,* upon the scalp and face. As these areas are few and easily detected, *e.g.,* by combing the hair or by slight pressure with a round

pinhead, the practitioner will have little trouble in identifying them. It is not necessary at first, however, to pay particular attention to them unless the patient complains of headache or scalp tenderness, as they usually have but little significance and soon pass away as the visceral condition improves. Cases XIII and XVII well illustrate the method of utilizing the pupillary phenomenon in conjunction with the areas of reflected hyperalgesia. In the absence of pain, which, when present, occurs in and about the areas of hyperalgesia, the related pupil is usually smaller than its fellow when the patient is resting quietly and without pain but upon movement or excitement and above all when painful pressure is made upon the diseased part or viscus the related pupil at once becomes larger than its fellow. The ocular phenomenon is, therefore, under the clinician's control and can, to a certain extent, be elicited at will. Traditional opinion among those who administer, as well as those who practice, in our courts of law seems to hold that such a thing as reliable objective evidence of pain does not exist. Contrary to such opinion which, indeed, is not confined to lawyers, but is widespread among the laity, the author hopes that in the pseudo-paradoxical pupil phenomenon the clinician will find a reliable objective, localizing sign of pain which may be used not only for the detection of malingerers but also for the protection of honest, oftentimes much maligned victims of their neighbor's negligence. In diagnosis the pseudo-paradoxical pupillary phenomenon as well as the reflected pain and hyperalgesia must always, however, be regarded merely as corroborative localizing signs of visceral disorders. This means that the careful clinician will take cognizance of them only as part of the general evidence. In the opinion of the author the time is ripe for the internist and general practitioner to take hold of the pupillary phenomenon more especially in conjunction with reflected pain and hyperalgesia and give them a place in their routine examinations. If this be done it will be found that many visceral conditions such as intercostal neuralgia, etc., will take on a new aspect. Interest in the physical examination will be stimulated and the clinician perhaps stirred to attempt recapture of some of the precious ground now held by the laboratory men.

Conclusions

(1) The pseudo-paradoxical pupil phenomenon is a reliable physical sign of somatic lesions associated with pain and tenderness.

(2) Taken in conjunction with referred (reflected) pain and the associated areas of referred (reflected) hyperalgesia, superficial and

deep, it is a reliable corroborative localizing sign of visceral disease.

(3) The pseudo-paradoxical phenomenon is a reliable objective sign of pain useful in the detection of malingerers and in the protection of honest victims of negligence injuries.

(4) In the mechanism and significance of reflected pain, areas of deep hyperalgesia have as much or even more significance than areas of superficial hyperalgesia.

(5) In practice the exact boundaries and names (numbers) of the areas of superficial hyperalgesia as they occur upon the trunk are of little importance, the main thing being to be able to detect an area which has been shown to be closely related to one or other of the viscera.

(6) On the trunk the complete areas of superficial hyperalgesia correspond so closely with the areas of root distribution of the thoracic and lumbar nerves that in practice the two sets of areas may be regarded as more or less coextensive, keeping in mind that the reflected areas of necessity must occur within one or more of the root areas.

(7) In the light of the present studies the areas of reflected pain and hyperalgesia described by Head require revision and amendment.

(8) The Dejerine or Klumpke-Dejerine sign in injuries of the spine about the thoracic-cervical junction needs revaluation.

(9) The study of the pupils in association with referred and reflected pain and hyperalgesia should be made an integral part of all routine physical examinations.

244 West 101st Street.

BIBLIOGRAPHY

1. Byrne. Am. Journ. Physiol., 1922, LXI, 93.
2. Byrne. Am. Journ. Physiol., 1924, LXVIII, 42.
3. Parsons. Journ. Physiol., 1901, XXVI, 366.
4. Byrne. Am. Journ. Physiol., 1921, LVI, 113.
5. Byrne and Einthoven. Am. Journ. Physiol., 1923, LXV, 350.
6. Ross. Brain, 1888, X, 333.
7. Mackenzie. Brain, 1893, XVI, 321; 1902, XXV, 368.
8. Head. Brain, 1893, XVI; 1894, XVII, 339; 1896, XIX, 153.
9. Byrne. Alienist and Neurologist, July, 1918.
10. Byrne. Journ. of Nervous and Mental Disease, 1921, LIII, 433.
11. Byrne. Am. Journ. Physiol., 1923, LXV, 482.

DEMENTIA PRECOX IN IDENTICAL TWINS

By G. H. Parker, Ph.D.

ZOÖLOGICAL LABORATORY, HARVARD UNIVERSITY

Since the appearance of Francis Galton's "Inquiries into Human Faculty" in 1883 a growing interest has been shown in the biological significance of twins. This has been expressed in numerous records of the structural, functional, and mental similarities and dissimilarities of these pairs of human beings.

A few years ago the *Journal of Heredity* issued a call for information about twins and subsequently devoted a whole number in volume ten to them (Danforth, 1919; Fairchild, 1919; Wilder, 1919; Woods, 1919a, 1919b). It has since continued to collect material concerning twins (Popenoe, 1922; Wiggam, 1923). That many twins are so much alike in appearance as to be indistinguishable under ordinary circumstances is well known. That they often act alike, think alike, and exhibit mental states of almost uncanny agreement has been claimed upon what is believed to be sound evidence. Probably because of the paucity of material very little attention has been paid to their diseases, especially to their mental diseases. This lack of information was emphasized some six years ago by Frantz (1919) who took occasion at the same time to give an account of a pair of twins suffering from dementia precox. The pathology of twins has been recently reviewed and reported on by Siemens (1924), and this year Murray (1925) published a very interesting address in which he discussed the general relation of twins to disease and has pointed out certain important biological aspects of this whole field. Frantz in his account of the pair of twins described by him dealt with the subject from the standpoint of nervous disease strictly and did not enter into a discussion of the biological problems involved. It is the object of this paper to touch upon these problems and to bring to the attention of students of this subject a second instance of twins suffering from dementia precox.

Case I. The twins, J. S. and I. S., who were the subject of investigation by Frantz (1919, p. 325), were fully described by him in a previous number of this Journal and the reader is referred to that description for further details. The following is a very brief summary of the family history of these twins. At about twenty-one years of age both were

suffering from dementia precox. This disorder they first exhibited at a little over a year from each other, J. S. in November, 1917, and I. S. in February, 1919. Their father was about sixty years old when they first began to show symptoms of the disease. He was an excitable but temperate man. The mother was of the same approximate age as the father and was healthy but nervous and excitable. Of the seven children born to these parents four girls were reported normal and one boy inclined to be nervous. The twins were the last of the seven to be born. Their grandparents had all died at rather advanced ages and from unknown causes. The parents had been married thirty-five years; there was no consanguinity; and the family history, so far as it could be ascertained, was negative.

Case II. In discussing the findings of the case just summarized with Dr. E. Stanley Abbot, formerly of the McLean Hospital, my attention was called by Dr. Abbot to a second case similar in many respects to that described by Frantz. In this instance, in which the twins were females, both have been inmates of the McLean Hospital. The following brief summary gives the essentials of Case II.

C. L. S. had grown increasingly deaf since childhood, the deafness not relieved by removal of adenoids at thirteen years of age. Following a severe attack of diphtheria when sixteen years old she occasionally talked to herself as though hearing voices. Though she was able to take two more terms at a private school, during the third the auditory hallucinations were more noticeable and she did not act normally. When nearly twenty, after a few weeks of mild neurasthenic symptoms, she rather suddenly became excited and noisy and was taken to a hospital. Since May 20, 1890, she has lived continuously in hospitals, including the McLean Hospital since December 28, 1909. During practically all this period she has talked but little, and that little has been mostly indistinct, incoherent, usually consisting of low muttering to herself. She has held no spontaneous communication with other patients, and showed little interest in her mother when the latter visited her. Though sometimes crochetting or looking at pictures a little, with an amiable placid expression, she has shown no sustained interest in anything and while so occupied has been liable suddenly and impulsively to destroy what was in her hands, or to jump up and tear or throw books, magazines, pictures, etc., to pound her own face or strike a nurse, or turn a picture face to the wall, then as quickly resume her placid state. She has shown many other habits and mannerisms, with latterly an increasing tendency to periods of rather prolonged excitement. Her case has been consistently diagnosed as dementia precox.

E. T. S., twin sister of C. L. S., when sixteen years old also suffered from diphtheria as her sister had. In 1890, a few months after C. L. S. had been sent to the hospital, E. T. S. suddenly became maniacal and

suicidal, and herself had to be taken to a hospital. She has been in hospitals ever since, at Butler Hospital for thirty years and at McLean Hospital since June 15, 1923. By the fall of 1892 she could not converse coherently, her memory was impaired, she "had no power of attention or appreciation," and was liable suddenly to scream and attack those about her. Gradually she got to occupying herself a little with picture books or cards. She often laughed to herself without obvious cause, apparently hallucinated. Following complete hysterectomy in 1902 her expression grew somewhat less strained and threatening and was often pleasant. She now rarely talks except in an incoherent way, muttering to herself. She is unoccupied, lying on a couch or sitting on a chair, paying little attention to what goes on around her. At all times since the beginning she has been liable to periodic outbreaks of noise and destructiveness, or other impulsive activity, such as tearing a picture from the wall, breaking a pane of glass, etc. Hers, too, is an unquestioned case of dementia precox.

The family history of these twins showed that their paternal grandparents had died at advanced ages, the grandfather at seventy years from natural causes, the grandmother at seventy-eight from kidney trouble. The maternal grandfather died at eighty-three years of age from natural causes and the maternal grandmother at thirty-five from puerpural fever. The father suffered a "sunstroke" about 1870 after which he was never well. He became hypochondriacal and later depressed and self-accusatory. He was admitted to the McLean Hospital April 17, 1874, and remained there until September 10, 1875. He occasionally talked of suicide. He has been in hospitals ever since. The mother to the time of her death a few years ago was reported in good health. She had had three children, a daughter born before the father's illness and now in normal health and the twin daughters born after the father's illness in 1870.

In commenting on the condition of these twins Dr. Abbot writes that it is obvious from the records that the onset of the illness was very gradual and insidious in the case of C. L. S. and probably sudden and acute with E. T. S. There is the possibility, though not the probability, that E. T. S. had very mild, unrecognized symptoms before her violent outbreak. But, however this may be, it is certain that both twins by the age of nineteen or twenty had dementia precox. In both there have been more or less frequent outbreaks of violence without obvious cause or motive. Each had certain mannerisms which were very suggestive of those in the other—a close enough resemblance to be very striking to a physician who, knowing one, saw the other for the first time. Before E. T. S. was taken to the McLean Hospital, thirty-three years after the onset of her psychosis, the twins had been in different institutions and had had no opportunity to see each other since the early stages of their illnesses.

Discussion

In dealing with the biological aspect of these two cases it is of prime importance to keep in mind that there are two distinct classes of human twins. In the first of these the two individuals are always of the same sex, both being males or both females. Such twins show at birth a single placenta and a single chorion. They are strikingly alike in appearance, having eyes and hair of the same color, similar complexions and such other bodily configurations as to make them often indistinguishable even to members of their own families. Such twins are of frequent enough occurrence to be known to every one; they are the Menaechmi and Dromios of everyday life.

They were long suspected of being the product of a single egg, which, instead of producing only one individual, divided in the course of its development into two. This suspicion has been rendered almost a certainty by the recent observations of Arey (1922) who has described a pair of such twins attached to a single yolk sac, an embryological condition scarcely explicable except on the assumption of a uniovular source. This belief as to the origin of such twins has been abundantly supported by what is known of the reproduction of armadillos. In the Texan armadillo, according to Newman and Patterson (1909, 1910), the four young produced at a birth are of the same sex, possess a common set of embryonic membranes, are strikingly similar in general configuration and are the products of a single egg. As quadruplets they parallel exactly the condition of the class of human twins under discussion (Newman, 1917, 1923). Such twins have been designated in the literature under various names: monochorionic, monozygotic, uniovular, homologus, similar, duplicate, and identical. I shall refer to them as identical twins.

The second class of twins may be of any combination of sexes, both males, or both females or one male and the other female. They are almost invariably provided with separate fetal membranes and where such appears not to be the case, the condition gives evidence of a fusion of once separate parts. The similarities of such twins may be great or small and amount to the same as those seen between any two children born at different times in the same family. There is every reason for supposing that twins of this class arise from two independently fertilized eggs. They have been variously termed dichorionic, dizygotic, binovular, heterologous, dissimilar, fraternal, and pigeon twins. I shall use for them the term fraternal twins.

The young of most mammals that produce litters are like fraternal twins in that their numbers indicate the numbers of eggs originally fertilized. Identical twinning, however, does occur among other mammals than human beings, though apparently only

rarely. It has been recorded by Assheton (1898) in the sheep and by Lush (1924) in Brahma cattle. No evidence of it was found in ordinary cattle by Gowen (1922) and by Lillie (1923). The regular occurrence of a double duplication in the armadillo resulting in four offspring is of course analogous to identical twinning.

It must be evident from what has been said that in considering the mental diseases of human twins it is of first importance to ascertain whether the pair of twins are identical or fraternal. Since identical twins spring from the same egg they possess the same germinal composition and, so far as diseases having a germinal background are concerned, twins from such a source ought to show characteristic likenesses. Fraternal twins on the other hand have no greater claim to germinal similarity than any two children of separate births in the same family and consequently their mutual relations to disease are not to be expected as closer than those met with in the ordinary children of one family. From this standpoint the occurrence of dementia precox in twins becomes an interesting biological problem. Are the twins of Case I and Case II as described in this paper identical or fraternal twins?

Frantz in describing the first pair of twins mentioned in this paper made no statement on this particular. Consequently, after reading his account of the case I wrote him a letter of inquiry. The fact that the twins were of the same sex was favorable to the interpretation that they were identical. As a result of their inaccessibility a close comparison of the two was impossible, but through the kindness of Dr. Frantz a family photograph of the twins as young boys was obtained. This photograph was fortunate in showing two full-face views of them in which the striking feature was the remarkable similarity of their countenances. They exhibited the usual agreement seen in the faces of identical twins, and in consequence of this and of the further agreement in sex I am led to conclude that these twins are identical.

In the second pair of twins, notwithstanding their relatively advanced age, their similarity was most striking. Dr. Abbot was personally acquainted with C. L. S. as a patient at the McLean Hospital, but he had never seen her twin sister. On visiting Butler Hospital he saw E. T. S. for the first time, mistook her for C. L. S. and inquired as to a transfer of C. L. S. from the McLean to Butler, plans for which had been under consideration. He was greatly surprised to learn that the patient in Butler was not C. L. S. but her twin sister.

After E. T. S. had been taken to the McLean I had the opportunity of seeing both twins within the interval required to walk

from one ward to another. They had the same color of eyes and the same kind of hair and, excepting that one was slightly more fleshy than the other, they resembled each other most strikingly. Their similarity completely confirmed the opinion that the two women are identical twins. This case then is a second one in which the two members of a pair of identical twins have exhibited what is nothing short of a striking parallelism in their nervous states in that both have run similar courses with dementia precox.

A search of the literature shows that these cases are not unique. Siemens (1924), who has made a very careful survey of the pathology of twins, has noted seventeen recorded instances of dementia precox (schizophrenia) among them. As this author remarks, it is not always easy to discover from the account set down by the reporting physician whether a given case is that of identical or of fraternal twins. But of the seventeen pairs noted six from internal evidence were without doubt identical, five were less certainly so, and six were probably fraternal. Of the six unquestionably identical pairs the sex of only four were given; in three the individuals were males and in one females. This shows, as the cases reported in the present paper do, that dementia precox in identical twins is not limited to one sex. The appearance of the disease is described in three of the six cases recorded by Siemens as simultaneous for each given pair and a year apart in a fourth pair. In the remaining two the records are in this respect deficient. The closeness of onset in those instances where the time of occurrence is given agrees very well with what has been recorded for the two cases described in the present paper.

The general agreement in this total of eight pairs of identical twins points at once to the importance of such pairs in the study of nervous diseases. Any pair of such twins has a common organic inheritance and this condition is attested by their striking similarity. Their differences must, therefore, be due to environment. Hence they afford an unusual opportunity, as was long ago pointed out by Galton (1883), of distinguishing those traits that are handed on through the germ from those that are produced by the surroundings.

In the past it has been usual in discussing human conditions to attribute much, often very much, to the environment, but no one can study a pair of identical twins, particularly those that have been brought up separately and under different conditions, without being profoundly impressed with the immense importance of the germinal inheritance. This it is that is chiefly responsible for that similarity in identical twins that makes them often indistinguishable even to their close associates. That they should dress alike is without doubt

chiefly due to the environment, but that their countenances should be indistinguishable is germinal. Galton (1883, p. 226) mentions the case of two twins who at the age of twenty-three were attacked by toothache and the corresponding tooth had to be extracted from each one. Many such cases are probably pure coincidences which have been remembered and recorded because of their striking relations. It is, however, entirely possible that, trivial as some of these relations may be, they may after all have a germinal background. The simultaneous occurrence in identical twins of children's diseases, such as chickenpox and the like, is probably quite as much an environmental affair as a germinal one, but with the occurrence of dementia precox in such twins the evidence is strongly in favor of a germinal source, for this disease, so far as I am aware, has never been attributed to infection. It appears to arise from a germinal taint, a maladjustment in the egg cell or the sperm cell or in both, and its simultaneous occurrence in identical twins, as pointed out in this paper, is strongly in favor of its germinal origin. That it should also occur in pairs of fraternal twins, as noted by Siemens (1924), is no argument against this view, for, if it is germinal in nature, it may well be expected in any of the members of a given family. What would be of great interest in this connection would be the discovery of cases of dementia precox in identical twins in which only *one* twin was affected. I know of no such instances, but the absence of them in the literature may be due to the fact that their importance is only now first being recognized and hence they may have been unnoted by the older observers.

The conclusion arrived at in this paper—that dementia precox is germinal in origin—is quite in line with what has been maintained within recent years about this disease and agrees in general with the conclusions contained in many recent publications (see Meyer, Jelliffe, and Hoch, 1911; Rosanoff and Orr, 1911; Rosanoff, 1913; Rüdin, 1916; Kraepelin, 1919; Bleuler, 1924; Siemens, 1924). Perhaps it is premature to declare, as Rosanoff (1913) has done, that dementia precox is a Mendelian recessive as compared with the normal state, but with so competent a worker as Rüdin (1916) supporting much the same declaration, the view is bound to be considered seriously. From the standpoint of the cases presented in this paper the germinal nature of the disease seems reasonably certain and this is quite in line with the statement of so conservative a writer as Myerson (1925, p. 215) who declares that dementia precox "breeds true." From a practical standpoint the occurrence of this disease in one of a pair of twins should lead the attending physician to an immediate examination of the other twin. The importance of

any kind of remedial measure in this disease must be evident from statements such as those recently made by May (1922, p. 460) to the effect that approximately 120,000 persons are now suffering from dementia precox in institutions in the United States and that their maintenance is costing the community about $25,000,000 annually.

REFERENCES

Arey, L. B. Direct Proof of the Monozygotic Origin of Human Identical Twins. Anat. Rec., 1922, Vol. 23, pp. 245–251.

Assheton, R. An Account of a Blastodermic Vesicle of the Sheep of the Seventh Day, with Twin Germinal Areas. Jour. Anat. Physiol., 1898, Vol. 32, pp. 362–372.

Bleuler, E. Testbook of Psychiatry. New York, 1924.

Danforth, C. H. Resemblances and Differences in Twins. Jour. Heredity, 1919, Vol. 10, pp. 399–409.

Fairchild, D. Twins. Jour. Heredity, 1919, Vol. 10, pp. 387–396.

Frantz, M. H. Dementia Praecox in Twins. Jour. Nerv. & Ment. Disease, 1919, Vol. 50, pp. 325–330.

Galton, F. Inquiries into Human Faculty and Its Development. New York, 1883.

Gowen, J. W. Identical Twins in Cattle. Biol. Bull., 1922, Vol. 42, pp. 1–6.

Kraepelin, E. Dementia Praecox and Paraphrenia. Edinburgh, 1919.

Lillie, F. R. Supplementary Notes on Twins in Cattle. Biol. Bull., 1923, Vol. 44, pp. 47–78.

Lush, J. L. Twinning in Brahma Cattle. Jour. Heredity, 1924, Vol. 15, pp. 25–27.

May, J. V. Mental Diseases. Boston, 1922.

Meyer, A., Jelliffe, S. E., and Hoch, A. Dementia Praecox. Boston, 1911.

Murray, G. R. A Study of Twins in Health and Disease. Lancet, 1925, Vol. 208, pp. 529–532.

Myerson, A. The Inheritance of Mental Diseases. Baltimore, 1925.

Newman, H. H. The Biology of Twins. Chicago, 1917.

Newman, H. H. The Physiology of Twinning. Chicago, 1923.

Newman, H. H., and Patterson, J. T. A Case of Normal Identical Quadruplets in the Nine-banded Armadillo, and Its Bearing on the Problems of Identical Twins and of Sex Determination. Biol. Bull., 1909, Vol. 17, pp. 181–187.

Newman, H. H., and Patterson, J. T. The Development of the Nine-banded Armadillo from the Primitive Streak Stage to Birth; with Especial Reference to the Question of Specific Polyembryony. Jour. Morph., 1910, Vol. 21, pp. 359–424.

Popenoe, P. Twins Reared Apart. Jour. Heredity, 1922, Vol. 13, pp. 142–144.

Rosanoff, A. J. Dissimilar Heredity in Mental Disease. Amer. Jour. Insanity, 1913, Vol. 70, pp. 1–105.

Rosanoff, A. J., and Orr, F. I. A Study of Heredity in Insanity in the Light of the Mendelian Theory. Amer. Jour. Insanity, 1911, Vol. 48, pp. 221–261.

Rüdin, E. Studien ueber Verebung und Entstehung geistiger Störungen. I. Zur Vererbung und Neuentstehung der Dementia Praecox. Monographie. Berlin, 1916.

Siemens, H. W. Die Zwillingspathologie. Berlin, 1924.

Wiggam, A. E. Twins Again. Jour. Heredity, 1923, Vol. 14, pp. 311–322.

Wilder, H. H. Physical Correspondences in Two Sets of Duplicate Twins. Jour. Heredity, 1919, Vol. 10, pp. 410–420.

Woods, F. A. Twins Prove the Importance of Chromosomes. Jour. Heredity, 1919a, Vol. 10, pp. 423–425.

Woods, F. A. A Definition of Heredity—"Nature vs. Nurture" Not a Good Expression. Jour. Heredity, 1919b, Vol. 10, pp. 426–427.

FOUR UNUSUAL CASES OF SPINAL CORD COMPRESSION

By Simon Rothenberg, M.D.

ATTENDING NEUROLOGIST, BROOKLYN JEWISH HOSPITAL, N. Y., ISRAEL ZION HOSPITAL, BROOKLYN, NEW YORK

This paper deals with a report of four unusual cases of spinal cord compression, and aims to demonstrate the difficulties still extant in making correct diagnoses, and understanding the nature of the lesions in spinal cord disease.

Despite our enhanced knowledge of the physiology, localization, and pathology of cord lesions, which has recently been gained through the advancement of modern spinal surgery, there still occur frequent errors, either in overlooking the presence of a new growth, or in differentiating them from local or general systemic diseases affecting the cord. It need only be mentioned to bring to mind the difficulties encountered in many instances where the differentiation between new growths, myelitis and the degenerative processes of the cord existed during the epidemics of encephalitis of recent years.

The literature is cumulative of reports illustrating cases that have been treated for long periods of time for multiple sclerosis, syringomyelia, myelitis, neuralgia, neuriditidis, and radiculitis that ultimately manifested their overbalancing symptomatology in favor of neoplasms. And to a much lesser extent, the converse of the situation has been experienced where operations for neoplasm were performed and the degenerative processes were found instead.

Then again the question of the presence of the neoplasm concomitant with other systemic diseases occurs and necessitates the utmost precaution in determining such condition. Such an experience is demonstrated in one of my cases.

The *first* of these cases is that of a man thirty-four years old, whose past personal history is of no significance except for four previous operations for osteomyelitis: of the femur in 1901, of the left radius in 1902, of the humerus in 1903, and of the right femur in 1916. He then remained well until September 9, 1922, when he was admitted to the Jewish Hospital in the care of Dr. Ravitch of the G. U. Department with the following story:

Ten days previous to admission he complained of a dull, aching pain in the left upper abdomen and in the left lumbar region, which persisted until two days ago. He then experienced a sharp cutting pain in the left back and radiating to his bladder. No history of hematuria was obtained. This pain

kept up for several hours, and then he was suddenly relieved, but then he complained of bladder distress and an inability to void. The temperature was 100, his pulse and respiration normal. The diagnosis of a renal calculus was made until the following day, when the patient complained of a feeling of numbness in both legs. He then came under my observation, and presented the following neurological findings. There were no cranial nerve or upper extremity involvements. The abdominal reflexes were both absent and there was present a distinct line of hyperesthesia corresponding to the dorsal ninth vertebra. The cremasteric reflexes were absent, and the knee jerks were slightly present in the left and absent in the right. On this first examination, no other sensory disturbances seemed to be present, but the patient was beginning to show a motor weakness in both legs. The left foot showed a marked clonus and a double Babinski and its modifications was present in both feet. His condition progressed very rapidly. The paralysis became complete on the following day and the sensory involvement followed thereafter, throwing out all the sensory tracts. The temperature sense and the pain sense showed no response, and then the sense of position and vibratory senses became affected. There was no pain or tenderness at any level of the vertebrae. The X-ray examination of the spinal column was entirely negative on two examinations. The spinal fluid was clear and the Wassermann and bacteriology were negative. His blood count on two occasions showed 8,000 and 12,000 leucocytes with 74 and 76 per cent polymorphonuclear. His temperature for five days after admission never rose above 102, and the maximum temperature during the three weeks after admission was about 103.

A consultation with Dr. Charles Elsberg on the 13th, four days after admission, corroborated the above physical findings, and his impression was that the patient was suffering from a transverse myelitis rather than from a returned osteomyelitis of the vertebrae, which was our original surmise. A later consultation with Dr. B. Sachs and Dr. Charles Elsberg resulted in the suggestion of performing an exploratory laminectomy. This was done, and a very extensive osteomyelitis of the ninth and tenth vertebrae, together with an epidural abscess was found. The pus seemed to surround the cord under each vertebra, and completely compressed it.

The temperature dropped after the operation, and the patient was apparently doing well for several days when quite unexpectedly, without any warning symptoms other than respiratory difficulty, he died, evidently from some embolic process.

The interest in this case lay in the rapidity with which the symptoms succeeded each other and produced a complete cord compression, and simulated an infectious myelitis.

The *second* case is that of a man fifty-five years old, a Russian Jew, and an Orthodox observer of his faith. His family history and past personal history was of no significance, except for the fact that three years previous to the present illness he had been treated at Mt. Sinai Hospital for pains in the hip and right leg, and was considered to be suffering from sciatica. He subsequently improved and was apparently well, except for occasional mild pains in his leg, which he considered to be rheumatic. Three months prior to his coming under observation, he began to complain of a numbness and coldness

of the big toe of his right foot. This soon spread to the other foot, and the numbness in the right leg spread until it involved the entire right lower extremity. He soon noticed a growing weakness in his right foot so that he would drag his right limb after him when walking. Later his left limb began to show similar weakness and the same numbness. But there was no pain throughout the entire period of his ailment. He had some difficulty in urination and was impotent, but otherwise showed no visceral disturbances.

The neurological examination showed no cranial nerve involvements: the upper extremities showed no weakness, disturbances of sensation or abnormal reflexes. His abdominal reflexes were absent, and the cremasterics were also absent. The right leg was more spastic than the left, and there was no atrophy of the muscles. He showed an ataxic gait and a decided impairment of motor power and coördination. His knee jerk on the right side was markedly exaggerated; the left knee jerk seemed normal. He had a right foot clonus and a right Babinski and Oppenheim, while the left foot reflexes seemed normal. The Achilles reflex was absent on the right, and normal on the left. On the sensory side, he showed a definitely impaired sensibility to pin prick below the right first lumbar vertebra. There was some diminution of sensibility in the right thigh and leg, and the temperature sense was markedly diminished on the same side. Touch, however, was intact throughout. The spinal fluid examination showed a negative Wassermann, and no other significant findings. A spinal cord tumor at the level of the ninth or tenth dorsal vertebra was suspected, and an operation was determined upon. The operation was performed by Dr. William Linder, and revealed the unusual finding of five or six globular clear gelatinous bodies, the size of a large pea, emerging from within the dura. An attempt was made to probe for further obstructions up and down the cord as far as could be reached from that incision, but no other obstructions could be found. The globules were subsequently examined by our pathologist and by the pathologist of the Johns Hopkins University; both reports confirmed the suspicion of it being a cysticercus-cellulosa infection of the cord. This finding was indeed an unusual one. Several years later I learned from Dr. Abrahamson that this patient came in his service at Mt. Sinai Hospital complaining again of symptoms which were probably produced by the same cause, but at a different level of the cord. He was not, however, operated upon again, and I have been unable to see him since.

The *third* case was that of a young unmarried girl of twenty-nine years who was admitted to the service of Dr. Victor Pentlarge in March, 1923, and was treated by him for a leutic infection which she had contracted two or three years before. The family history was negative, and the past personal history is that she was operated on for mastoids with ligation of the jugular vein on the same side, and since then she has had a chronic discharging wound. Her hearing was somewhat defective on that side. Her leutic history is that she had contracted syphilis and showed a primary lesion, a secondary rash, a sore throat and pains in her bones. Her blood Wassermann was four plus. She had been treated with salvarsan and mercury, and received two complete courses of several months each. She was not pronounced cured, after having been treated for two years. One month before admission she began to complain of numbness in all toes of the left foot, which later extended up to the knee. She then developed a weak ankle which became sprained several times. She had decided difficulty in walking downstairs, and would often trip. Two

weeks before admission she noticed poor control of her bladder and rectum. Examination at that time revealed irregular and equal pupils reacting to light and accommodation. There were no ocular palsies. There was some impairment of hearing on the side of her mastoidectomy. Her walk showed an ataxic gait and a tendency to fall to the left. Coördination was definitely impaired in both lower extremities. Romberg was present. There was a loss of sense of position in both lower extremities. Her knee jerks were decidedly exaggerated, and Babinski, Oppenheim, Chaddock and Gordon were present. She had a bilateral ankle clonus. Abdominal reflexes were both absent except in the right lower quadrant. Vibratory sense was impaired. The pain sense was dim from the fourth dorsal segment down. The tactile sense was retained throughout the body. No astereognosis. The temperature sense was decidedly diminished in both legs. There was no evidence of any muscular atrophy. We were therefore dealing with a case in which there was decided sensory dissociation and no findings suggestive of any cranial nerve involvement. The eye-grounds were negative. The spinal fluid examination showed two lymphocytes, 2 mm. albumin, ring of Fehlings reduced, four plus positive globulin, and a two plus Wassermann. The blood Wassermann was one plus. Her motor weakness became very progressive within a period of six weeks. Pain did not seem to be a prominent symptom. X-ray examination of the spine was entirely negative.

The diagnosis in this case centered around the question of whether we were dealing with a luetic lesion of the cord or of a new growth. Our opinion favored the advisability of exploring the cord at the level of the eighth, ninth, and tenth vertebrae. The patient was subsequently placed in the hands of Dr. Elsberg, who substantiated the suspicion of a new growth rather than that of a luetic lesion, and operation revealed the presence of an endothelioma. The superimposed condition was, to say the least, a novel one in the experience of spinal lesion diagnoses.

The *fourth* case is that of a young man, age twenty-four, single, a clerk by occupation. He gives a history of having suffered from Hodgkin's disease for nine years. He had been at the Jewish Hospital in January, 1923, and had then presented a mass in his abdomen. His past personal history revealed no previous neurological condition. He was treated for this mass in the abdomen with X-ray therapy and was discharged from the hospital without any noticeable change in his condition. The laboratory report of a gland study was that of Hodgkin's disease. He was further treated with X-ray and subsequently this mass in the abdomen was dissipated.

The present history concerns his admission to the hospital, December 4, 1923. He then showed a weakness of the lower extremities which came on five days previously. There was a hesitancy in urination, and he complained of sticking pains in each shoulder joint existing for the past six weeks. These pains radiated towards the spine across the scapulae. The pains became steadily worse. The weakness of the lower extremities was increasing, and he complained of a caving-in sensation when walking. He soon was confined to bed, and unable to raise either leg. There was a total inability to void.

Temperature and respiration were normal, and he showed no other signs of illness. There was no apparent anemia. His glandular system showed definite enlargement of all glands. A few small discrete glands were palpable in the submaxillary region on both sides. There were some glands present in the neck, and some above the clavicle. They were not tender, and were the size of a small pea. His spine was rigid with marked tenderness localized in the interscapular area. His chest and heart showed a negative examination. The formerly described mass in the abdomen was absent.

Through the courtesy of Dr. Alex Luria, the patient came under my observation, and a neurological examination showed no cranial nerve involvement, and no sensory or motor involvement in upper extremities. The tendon reflexes were normal. The trunk showed absent abdominal reflexes and a sharp line of hyperalgesia at the level of the seventh and eighth dorsal segment, and below that, marked diminution to pin pricks. There was no tenderness of the vertebrae. The cremasteric reflexes were also absent. The knee jerks were equal and hyperactive. There was no clonus or Babinski or Oppenheim. But there was complete loss of motor power in both lower extremities, with a loss of pain and temperature sensibility below the fifth dorsal segment. The vibratory and muscle-joint sensibility was absent below the tenth dorsal segment, and diminished below the fifth dorsal segment. There were frequent and involuntary twitchings of the muscles of the thighs. It was evident that we were dealing with a complete compression of the spinal cord. The knee reflexes were subsequently lost, and there was a diminution of the tactile sensibility below the tenth dorsal segment. A diagnosis of a compression of the cord from a lesion produced by Hodgkin's disease was suggested, and another X-ray treatment was advised for this condition. On the 10th day of December, the X-ray treatment was given, and soon thereafter marked improvement in his condition was manifest. On the 21st, the superficial reflexes in the lower extremities were present, and he was able to move his right leg slightly. On the 2d day of January, 1924, he was able to move both legs, and lift both feet from the floor, making a few steps. His glands became smaller, and the X-ray treatment was repeated. On the 14th there was still some weakness of the left leg, and soon thereafter he was able to walk on crutches. He made a complete recovery, and is to-day at his work, and has remained well since.

This case again is of interest because of its rarity as a complication of Hodgkin's disease. The consideration of some other factor in the causation of this compression was, of course, in question. The findings pointed very poignantly to a lesion similar to that of the systemic disease, but this compression myelitis might well have been a primary manifestation, and then the diagnosis would hardly have been hit on. It is indeed surprising that such findings do not occur more frequently, since Hodgkin's disease is not an uncommon disease.

Summary

Significant in the symptomatology of all these cases was the rather rapid development of the compression, and the infrequency

of pain as a prominent symptom. In the case of the osteomyelitis, the rapidity of succession of paralyses following the initial symptoms of the pain and the complete destruction of all the tracts produced by the pressure of the fluid pus under the vertebrae is indeed noteworthy. The lack of temperature and chill which is so characteristic of osteomyelitis was here absent. The X-ray findings showing no lesion of the vertebrae is also significant. In the second case, the rarity of the disease as a factor in producing spinal cord compression is to be commented upon, since the literature on the subject records no case in recent years. Oppenheim speaks of several cases reported by other men, and one by himself, but they were all lesions affecting both brain and cord, and did not simulate neoplasm of cord. The likelihood of this man having multiple lesions, however, is very great, especially since he has again complained of these symptoms.

The case of lues merits reporting because of the unusual finding of a superimposed lesion upon an existing luetic condition, which might well have caused the cord compression. The last case is reported because of its uncommon character in the etiology of cord lesions, and because of the remarkable results obtained through X-ray therapy. The rapid development of a complete paraplegia and the subsequent recovery from such a severe lesion after the first and second treatment is of significance.

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

The Four Hundred and Twenty-Third Regular Meeting, November 10, 1925, with the Neurological Section of the Academy of Medicine, the President, Dr. I. Abrahamson, Presided.

THE ABORTIVE TYPE OF FRIEDREICH'S ATAXIA

Dr. Charles R. Rombold
(By Invitation)
and
Dr. Henry Alsop Riley

(*Authors' Abstract*)

The object of this brief communication is to record a family consisting of three generations in all of which can be found individuals who at varying times of life manifest a group of symptoms and physical signs which constitute a *forme fruste* of the entire syndrome of "hereditary ataxia." This group of symptoms is limited to the lower extremities and constitutes what may be termed an abortive type of circumferential spinal degeneration or Friedreich's ataxia.

The family consists of three generations which we have been able to investigate. The passage of time and the birth of later children may supply us with further material. The mother, who presents the most complete development of this abortive incidence of the disease, is the progenitor of fifteen children. Of these fifteen children the first, second, third, eighth and tenth are dead; the first child dying at the age of three months from diphtheria; the second at the age of ten months from pneumonia, and the third at the same age and from the same disease. The eighth child died at the age of seventeen years from tuberculosis, while the tenth child died at the age of five months from pneumonia. There remain ten living children in the second generation. Of these the first, sixth, seventh, ninth and tenth children present evidences of the disease. In the third generation there are six children. The children of the oldest member of the second generation, himself affected by the disease, both show symptoms of the disturbance, but the children of the second and third members of the second generation, themselves not involved by the process, have not as yet manifested any indication of spinal cord degeneration.

In establishing the chronology of this affection, it has been neces-

sary to date the appearance of symptoms from the earliest noticed difficulty with the feet, as this is the only symptom which caused these patients any difficulty and has resulted in their seeking relief and thus coming under observation. In the young children of the third generation, however, the foot deformity is as yet very scantily developed and the other symptoms, the loss of the patellar and Achilles reflexes and the development of an abnormal reaction of the big toe to plantar stimulation, are also only beginning to appear. Although this fact may not be conclusive proof, yet it may be advanced as tentative corroboration of the assumption that the appearance of the foot deformity is approximately as early as the reflex change.

In considering this family we find three generations showing a disease which presents many of the characteristics of an hereditary familial disease. This disease begins as does the typical Friedreich's disease with some disturbance in gait and the development of the foot-deformity, a pes cavus, which is typical of this disease. The process advances sufficiently to destroy the reflex arc controlling the deep tendon reflexes of the knee and ankle probably through the degeneration of the collaterals which sweep forward from the entrance of the dorsal roots into the spinal cord to end about the ventral horn cells or intercalated cells which thus complete the reflex arc. This process then advances and involves the reflex arc controlling the reaction of the toes to stimulation applied to the plantar surface of the foot, so that the normal plantar flexion is lost and either a clear-cut Babinski sign results, a Fanning reaction, or failure of the toes to present the normal plantar flexion. The degeneration terminates apparently at this point and the other characteristics of the disease, the ataxia, the scoliosis, the nystagmus and the dysarthria fail to develop.

Discussion: Dr. Riley said: I have nothing to add to what Dr. Rombold has told you, except possibly to speak of the literature which we investigated. I went over the Surgeon General's Catalogue and could only find one reference to an article which called attention to the occurrence of such a condition. This appeared in an Italian journal published in Naples and I have not as yet been able to get access to it. Oppenheim says that abortive cases are known to occur, but in most of the other text-books there is no reference made to any abortive types of Friedreich's ataxia, and so we thought we would present this family, showing what is really a lumbar Friedreich's ataxia, to establish the validity of this symptom complex.

Dr. Bernard Sachs said: The point which Dr. Riley raises is one that interests me, and that is, whether it is worth while to establish an abortive type of Friedreich's disease. So far as the literature of it is concerned, with which I am fairly well acquainted, I do not think that there would be anything astonishing in seeing cases of familial disease in which all the symptoms are not fully developed, and that is practically what an abortive type of such a disease as this would mean. The point which is very characteristic about the patients mentioned here is that they begin with a pes cavus,

and that is a point of great interest, as there are only a very few diseases which begin in that way. There are only two other diseases which would have to be considered at all. This pes planus or something which approaches clubfoot is characteristic of Friedreich's disease and also characteristic of the Charcot-Marie-Tooth type, and then there are families which have something like a congenital clubfoot and nothing else, so those are the only conditions which have to be considered. It is rather an anomalous condition of things to think of Friedreich's disease being a stationary condition for a period of thirty years, as I think was the case of the mother presented here. That is a somewhat striking variation from the average case of Friedreich's disease that we are accustomed to see. The general symptomatology, I have no doubt, without having gone into the matter carefully here, is in line with Friedreich's disease, although nothing was said about the behavior of the pupils in these cases, which would be a very important point in the differential diagnosis.

The point I would like to insist on is this, that in all familial diseases, especially in those of degenerative disorders, there may be all sorts of combinations of symptoms and of combinations of degenerations. A very striking symptom which I had occasion to see was an association of what appeared to be a progressive muscular atrophy of the hand combined with the symptoms in the lower extremities characteristic of Friedreich's disease.

In Friedreich's disease the psychic defect is very striking. In the two generations which we saw here the psychic defect is not very marked, if present at all. We cannot draw the clinical picture of an hereditary familial disease too closely. There are almost certain to be variations from the type. The only question is whether there are a sufficient number of characteristic symptoms to warrant this being allowed to be described as an abortive form of Friedreich's disease. To my mind it represents something beginning like Friedreich's disease in several generations, and it would be important to know that not all the symptoms are present in these cases. It is, however, interesting to know of a family of three generations, some members of which present some of the symptoms.

Dr. Smith Ely Jelliffe said: I think it is not without interest first to call attention to the fact that this year, 1925, is the one hundredth anniversary of Friedreich's birth, so that we have Charcot and Friedreich both born one hundred years ago. Secondly, it strikes me that the opportunity for judging cases of this kind is fraught with a great deal of interest. Dr. Riley knows with what difficulty we brought together a symposium of our Research Society on heredity and heredo-familial disease. He knows with what vigor I assailed him, as secretary, from various points of view as to what he meant by the title they had given to my referat, namely, whether these heredo-familial diseases of the nervous system showed dominant or recessive factors. Some of you that have taken the trouble to struggle through the rather lengthy paper which I presented to the Research Society may be aware that I said we were not yet in a position to formulate any such problem, for up to the present

time, from the Mendelian point of view, we did not have enough information. Although it might appear on the surface from the charts shown by Dr. Rombold that dominant factors had passed down through three generations, still those charts do not provide enough information concerning the collateral branches to settle the question as to whether dominant or recessive factors have entered into the heredity of this disturbance.

As to the question of types in general, from my point of view there is no such *thing* as "Friedreich's disease." Practically all classifications are only useful "fictions." They deal with groups of symptoms which Friedreich originally pointed out, and to which he gave a thoroughly artificial, though useful, "classical" picture. Since then the unthinking among us have been trying to fasten everything which appeared as he described it and make up a "clinical disease" as a bit of reality. But there are an enormous number of variations, aberrant types, if one so wishes to phrase it, and that must be so, as Dr. Sachs has said, in most of the heredo-degenerations.

In commenting upon Dr. Rombold's statement about the absence of literature on these types, I am a little surprised that he did not run across Hanhart's studies in Switzerland on Friedreich families. Hanhart made a survey of Switzerland and collected all the cases of Friedreich's disease throughout all Switzerland. As it occurs through certain families in Switzerland there is a very interesting point bearing on the general lethal factor of incest. That would seem to argue something in the nature of a lethal factor introduced by some recessive process in the genesis of the complex of functions which we know is closely related with equilibrium. Here the stimuli come up through the receptor arcs through the spinal cord and are more or less correlated in the cerebellar regions. We find certain groups in which the cerebellar components are more involved than are the spinal components. This Dr. White and I have emphasized in our Diseases of the Nervous System, Fourth Ed., 646, 654.

Dr. Joshua Rosett said: Everybody will agree with Dr. Sachs that variations in the particular symptomatology of a given hereditary disease are to be expected. But how are we to account for a variation in the symptomatology of a disease which manifests itself, as in this case, in an affection of the osseous system of the foot in some members of the family, in a diminution or disappearance of the patellar reflex in others; in a sign of Babinski in some and in the typical ataxia in others? Surely not by an inherited malformation of any one system, for as a matter of fact, the parent from whom the various manifestations of the disease were inherited exhibited some of them, but not all. A rational hypothesis appears to me to be the inheritance of a unit factor—of some poison—which exists in the body-fluids of the members of the affected family, and which strikes one system or another according to special susceptibility of the individual. In a study of Thomsen's disease some years ago I found variations of a similarly wide scope. Some members were psychotic without any muscular abnormality. Others had lost the

patellar reflex. Still others were afflicted with severe pains in the lower limbs. Others still exhibited the manifestations of the muscular abnormality, and the degree of the abnormality and the special mode by which it could be elicited differed in the several individuals within wide limits. In that case, too, a rational mode of accounting for the various manifestations of the inherited disease is by the assumption of a noccuous inherited agency which is to be found in some of the body fluids and which affects one system or another according to the grouping of the other inherited units, that is to say, according to particular susceptibility of the person. Such an inherited unit factor may be legitimately called a sublethal factor. A lethal factor has been established by students of heredity in certain forms of the Drosophila fly.

From such a standpoint we must look with suspicion upon any extraordinary number of deaths in such a family, irrespective of the immediate cause of death. The fact that a number of children in this family died from such a common affection as pneumonia does invalidate the suspicion that the pneumonia proved lethal only in coöperation with the inherited sublethal factor in possession of the members of the stricken family.

Dr. Riley (closing the discussion) said: I have nothing further to say except that as Dr. Sachs has pointed out there are complete transitional forms between all related types of disease, but this does not seem to me to fall exactly into the category of a transitional form. Friedreich's ataxia as a rule begins in early adolescence and progresses almost inevitably to a fatal termination as the result of some sort of intercurrent disease after the primary condition has existed for a considerable length of time. This syndrome which we have presented to-night is a Friedreich fragment. It appears as does the typical Friedreich's disease but comes to a spontaneous cessation after the development of a few symptoms and physical signs and on account of this fact and the paucity of published records it was considered justifiable to present this family.

THE NEUROSES IN THE COURSE OF CHRONIC LETHARGIC ENCEPHALITIS

Dr. Foster Kennedy

(*Author's Abstract*)

Dr. Foster said that heretofore descriptions of mental illness had been but descriptions of mental mechanisms, with no regard whatever to disordered physical states of neural apparatus. He narrated cases of encephalitis in which altered emotional tone was the chief result of the disease, accompanied by altered vital rhythm, such as in sleep, respiration, or the intake and output of fluid; cases too in which abulia was the outstanding feature. He emphasized the identity between so-called "functional" illnesses, such as the neuroses and many of the post-encephalitis sequelae. These latter have come from a periaqueductal lesion—must we look for the cause of the former solely in psychical terms? Must we not cease to be satisfied

with a purely mental explanation due to environmental or instinctive stress? Such explanations are useful as far as they go, but so far are they from being an ultimate analysis, "they are but figure-skating on the surface of the problem"—they have served to make profitable the time which must pass while physiology takes on a larger stature and more definite form, but the neurologist of the future will try by the examination of defects of structure to illuminate defects and perversions of mental function and emotional personality.

THE MENTAL SYMPTOMS IN EPIDEMIC ENCEPHALITIS

Dr. R. T. Folsom (By invitation)

(*Author's Abstract*)

The basis of this study consists of an analysis of the case histories of 71 patients admitted to the Manhattan State Hospital and diagnosed as psychoses with encephalitis lethargica. The first patient so diagnosed was admitted April 2, 1920, and the last July 16, 1925. There were approximately twice as many males as females, respectively 48 and 23. The number admitted each calendar year is of interest as a possible reflection of the incidence of encephalitis in the general community. The admission curve was high in 1921, then dropped somewhat for three years, and has reached its peak with 21 cases in the present calendar year of 1925.

The age incidence of this series showed that the most vulnerable period was the second decade which contained 36 cases, and this vulnerability held good for each sex. In the entire series there were 20 children under fourteen years of age, 15 boys and 5 girls. So in this material the greater age incidence occurred in the period of preadolescence and adolescence, which may have some correlation with the psychiatric aspects to be mentioned later.

The incidence of influenza prior to the onset of encephalitis was inquired into and it was found there was a positive history of influenza in 24 of the total number of 71. It was also found that 59 had suffered from lethargy, 9 from inability to sleep and a history covering sleep disturbance was lacking in three.

In every case of this series neurological syndromes of the types frequently described in encephalitis were present. Some of the most numerous syndromes were: 9 Parkinsonian ocular; 8 oculofacial; 7 uncomplicated Parkinsonian; 7 Parkinsonian myoclonic; and 37 other neurological admixtures containing 4 cases or less each.

A study of the personality makeup of these cases was made for the purpose of determining if there were any correlating factors between the type of makeup normal to the given patient prior to the onset of his encephalitis, and the actual psychotic symptoms exhibited. The complication showed that 41 were of normal makeup; 16 of an unstable makeup; 13 of a seclusive makeup, and one with a makeup unknown. Of the 41 of the normal makeup, 35 exhibited psychoses consisting of emotional instability and 6 had deliria. Of the 16 unstable individuals, 14 had a psychoses consisting of emo-

tional instability, 1 had a paranoid trend with an acute episode of apprehensive agitation. Of the 13 seclusive types, 8 had an emotional instability, 2 had delirium, 1 had delirium followed by emotional instability, 1 had an acute paranoid hallucinatory episode and 1 had a dementia precox syndrome. These figures would seem to indicate that irrespective of the type of makeup a very considerable majority of each type of makeup exhibited a similar clinical picture characterized by pathological emotional instability, the outstanding exception to this being a seclusive individual in whom a dementia precox psychosis ran true to the makeup.

A consideration of the psychiatric clinical picture presented in this material permits of a division into four groups; first, 63 cases characterized essentially by emotional instability; second group of 6 uncomplicated deliria; thirdly, 1 case consisting of an acute hallucinatory paranoid episode, and fourthly, 1 dementia precox syndrome. The emotional instability group of 63 comprises such an overwhelmingly large number of the cases that one is led to consider it the paradigm of psychoses associated with encephalitis. Of this group of 63, 50 were uncomplicated emotional instabilities; there was 1 case of paranoid trend followed by emotional instability; 3 were complicated by apparent hysterical manifestations and 3 were simple depressions; 6 had a delirium followed by emotional instability. It is to be noted that the delirious cases mentioned refer to the psychotic condition presenting itself in the hospital and do not include the history of delirium which is so often present in the earlier encephalitis.

In this large group of emotional instabilities the history obtained in the great majority is that of an individual who, following the attack of encephalitis, became irritable, combative, indulged in screaming or crying episodes and fits of temper, and theft and sex delinquencies. Under hospital regime the instability tends to become more episodic perhaps due to disciplinary effect, and during the quiet intervals they have expressed an unusual degree of insight into their abnormal behavior and lack of emotional control. These cases are further characterized by clear sensorium and lack of memory impairment and an absence of hallucinations and trends.

The psychotic manifestations shown by the 20 children under fourteen years of age were in general characterized by an extraordinary degree of irritability, impulsiveness, incorrigibility, theft and sex delinquencies. The emotional instability in adults was less intense in its manifestations, the theft and sex delinquencies did not prevail in the older cases with a few exceptions in later adolescence. The simple depressions occurred in the fourth decade, and the deliria with two exceptions occurred among the older patients in the third, fourth and fifth decades, and were admitted a comparatively brief period following their encephalitis. Whereas the date of onset of encephalitis prior to admission in the emotional instabilities was measured usually by years instead of months.

Brief abstracts of cases were then cited, one of these, an uncomplicated emotional instability occurring in a person of normal

makeup; three of emotional instability complicated by hysterical elements and another case with a dementia precox syndrome.

The ultimate course of these cases is of some interest. Ten were transferred to other hospitals of whom three were improved and seven unimproved at the time of transfer; their present condition is unknown.

Six died in the hospital; cause of death as follows: 1 pulmonary tuberculosis; 1 terminal exhaustion; 2 myocarditis; 1 chronic endocarditis, and 1 bronchopneumonia. In all these cases autopsy permits were refused. Twenty-three have been discharged from parole of which 6 were recovered, 11 improved, and 6 unimproved. None of these cases received any sodium iodide treatment. Five are on parole at the present time; of these, 4 are much improved, and 1 improved. Three of these have received injections of sodium iodide, and 2 have had no special medical treatment. Twenty-six remain in the hospital; of these 10 have received treatment consisting of intravenous injections of sodium iodide, 50 c.c. 10 per cent solution twice a week, and are improved; 4 are much improved under the same treatment; 10 are stationary; of these 3 have received no treatment; 6 have received treatment only occasionally because of refusal to submit to intravenous injections, and 3 have received sodium nucleate subcutaneously because of too small veins for intravenous treatment.

It should be noted that with the exception of the one case cited above none of this series of cases still remaining in the hospital show evidence of a dementia precox psychoses. A comparison of cases discharged from the hospital before any special medical therapy was given would indicate a tendency to spontaneous remissions in a certain number of cases. On the other hand, intravenous treatment with sodium iodide, which was commenced in November, 1924, and which at present is only in a tentative stage, would seem to indicate at the present time at least that cases do better under such therapy than without it.

UNUSUAL SIGNS OF EPIDEMIC ENCEPHALITIS

Dr. L. Grimberg

(*Author's Abstract*)

The history of three cases is reported, showing an unusual post-encephalitis syndrome, and a very unusual development. All three showed a torticollis with myoclonic seizures, pes equinus, a lateral curvature of the vertebral column, and a peculiar gait. One patient showed a slight rigidity of the right side of the body with a slight hypotonia of the left side. Another patient had typical decerebrate-like attitude during the myoclonic seizures, and the third patient showed a marked hypotonia of the extremities, except the right arm, which was slightly rigid. The third patient started four years before as a typical Parkinsonian syndrome following encephalitis and his present state, that of hypotonia, developed gradually. His present state is that of a dystonia, but with the absence of the dystonic movements.

The analysis of the posture and movements of the three patients,

classes them as belonging to the syndrome of dystonia, a very unusual form of post-encephalitis.

Discussion: Dr. J. Ramsay Hunt said: Epidemic encephalitis has been so frequently the subject of discussion in the past few years that it will be quite unnecessary to detail the usual symptoms and clinical features, which we are all familiar with. To my mind, the most important points for emphasis are the peculiar nature of the sequelae and the marked tendency to recurrences manifested by this disorder. In this respect its behavior is so different from acute poliomyelitis, also an inflammatory infection of the central nervous system. In poliomyelitis there are paralytic residuals depending upon the severity of the attack, but no recurrences. In epidemic encephalitis, however, the tendency to recurrence is very marked, resembling in this respect disseminated sclerosis and syphilis of the central nervous system. It is now generally recognized that Parkinsonian occurs in about 25 per cent of the cases, although this percentage had varied somewhat in different epidemics and in different countries. Von Economo, who first called attention to this disorder in 1917–18, also recognized the existence of a chronic recurrent type. In an histological study of such a chronic case he found, as one would expect, the coexistence side by side of recent inflammatory as well as older chronic lesions. Greenfield and Buzzard also found chronic changes in the older cases, and laid especial emphasis on the calcareous deposits and degeneration. As I look back on my experience with this disease I can recall a few cases that are of special interest from the standpoint of symptomatology. I remember, during the later period of an epidemic, seeing a boy who was twelve years of age who had taken cold followed by a moderate elevation of temperature. The following day slight choreiform twitchings developed which lasted 48 hours only. In ten days he was well with the exception of an insomnia which lasted for months. There was a complete reversal of the usual sleep mechanism. He was drowsy during the day, and had a very curious wakefulness with restlessness coming on rather punctually at night. Before the epidemic I do not know what we would have called this. We might have regarded it as a very mild or abortive type of Sydenham's chorea. Neurologists were very quick to see this analogy in regard to cases of Sydenham's chorea, which has certain infectious qualities, and Marie and Foix examined a fatal case and found lesions similar to those seen in encephalitis in the central portion of the brain, especially around the corpus striatum.

I recall another case that gave me a great deal of concern at one time. It was that of a woman who had paresthesias which seemed to be of an organic type, and a typical Argyll-Robertson pupil. There were no other symptoms of tabes. The reflexes were normal. The neurological and serological findings were entirely negative. When I first saw her we were not aware then that encephalitis can produce typical Argyll-Robertson pupils, but she had an absolutely typical Argyll-Robertson pupil. Everything was negative except the pupils and the paresthesias. The past history showed that two years before the woman had had what was regarded as a mild attack of "grippe."

She was a little delirious for a night or two, and that was all, and this was the only unusual feature of the attack. The assumption is that the attack was one of encephalitis, comparatively slight, and that the later symptoms were residuals referable to the midbrain and the thalamic region.

The mental aberration and changes in character one sees, especially in children, are very interesting. It seems to me that the explanation of some of these peculiar reactions should be looked for in the personality of the individual, in the individual makeup; and then the brain is affected by organic and toxic lesions, paralysis and inhibitions result, which release a symptomatology which will vary with the peculiarity of the individual.

Dr. George H. Kirby said: Dr. Folsom's report on the cases observed at the Manhattan State Hospital is a welcome contribution because it throws some light on the important question of what form the late and residual mental reactions take in epidemic encephalitis. It is, of course, well known that in the initial or acute phases of the disease, presumably at the time when the brain is invaded, the mental symptoms are in the main those which usually accompany an organic insult of a toxic-infectious nature. It is at this time that the lethargy, stupor, coma, delirium or mental confusion stand in the foreground of the clinical picture. In my experience very few cases fail to show some degree of confusion or delirium; even when there is a persistent wakefulness there is, nevertheless, a tendency to delirious dips or phases, especially at night. These may be transient and therefore easily overlooked. Dr. Hunt has just cited a very good example of a mild delirium which evidently at the time it occurred attracted little attention.

It is the succeeding neurotic and psychotic manifestations that gradually emerge in the further course of the encephalitis that have been emphasized in psychiatric clinical groupings. Dr. Folsom has shown that a large majority of cases arriving in the state hospital present a clinical picture characterized essentially by an emotional instability *plus* various behavior disorders and delinquencies. More than 85 per cent of the cases showed this type of reaction and little that went beyond it. I was rather surprised that the more complex psychotic reactions were not more frequently encountered, although paranoid states, schizophrenic syndromes, agitated depressions and manic-like excitements are to be found in the series of cases reviewed.

Dr. Folsom's results seem to support the view that epidemic encephalitis, which pathologically has a special affinity for the brain stem and basal nuclei, has as one of its main clinical expressions a pronounced and often lasting disturbance of the emotional mechanisms. Even in the lethargic or stuporous phases of the disease an emotional disturbance of the nature of a marked inhibition of the affect is often the most striking symptom, a fact which has led Kennedy and others to speak of an "emotional stupor." Later on in the course of the disease an opposite tendency is seen in the breaking down of inhibitions and diminished emotional control leading to the behavior disorders which apparently are the most frequently encountered clinical reaction types in hospital cases.

In contrast to the abnormal emotional reaction is the good preservation of the higher psychic functions—the intellectual faculties, memory, orientation and mental grasp are usually quite well preserved. The absence of deterioration or dementia such as accompany other organic brain diseases is an outstanding fact even in advanced cases of encephalitis. One frequently observes patients who appear quite dilapidated, careless of their persons, inactive, dull, with a vacant expression and the usual Parkinsonian postures. However, on examination one finds that such patients have a good grasp of the surroundings, well preserved memory and ability to give correct information about themselves and their sickness, showing that there is little or no mental deterioration.

Dr. Folsom, in speaking of the relation of preceding personality types to mental symptoms, touched briefly on a point about which there has been much discussion, namely, what is the explanation for the more complex psychotic clinical pictures that sometimes appear in the course of an encephalitis—such as agitated depressions, paranoid states or schizophrenic syndromes. It could hardly be maintained that post-mortem findings help in understanding these complex psychotic reactions. To me they seem to be much more closely related to the underlying personality makeup and special life experiences of the individual. Certainly, in other organic conditions it has been shown that mental symptomatology is to a large extent conditioned by the underlying personality and psychological makeup of the individual. Dr. Folsom gave examples of this relationship in two of the cases which he briefly described. One was the case of a boy who showed very odd behavior which on analysis by Dr. Hinsie was shown to be definitely related to some previous experience and submerged wishes of a sexual nature. These were quite obviously expressed and realized with little or no symbolism in the attitudes and motor reactions which he exhibited during the psychosis. The other case, the one exhibiting a schizophrenic syndrome, has developed on a definite schizoid background. One could almost feel that this was the only type of reaction that that particular individual would be capable of showing in the presence of an organic brain disease. The same principle applies, I think, in general to the more complex psychotic reactions. They are apparently best explained, so far as the symptomatology goes, on the basis of the psychology of the individual.

Dr. Bernard Sachs said: I am afraid the average person would say we have been making altogether too much fuss about epidemic encephalitis, but the historian of the progress of neurology will have to say that there was a distinct awakening at the end of the Great War with the coming of epidemic lethargic encephalitis and with the incident publications and researches on extra-pyramidal disease. It is very remarkable to note the effect that this one disease has had on neurology of the present day. Nothing has happened to us or to the community that can be compared with the importance of this disease, for it has had its effect upon almost every branch of neurology, and particularly upon the diagnostic powers of neurologists.

As for some of the special questions that have come up; I shall

refer to some of the things I think are of practical importance. Dr. Kennedy is very ingenious in many of his statements regarding the development of the neuroses and psychoneuroses. I see only one danger. After a person has had a syphilitic infection, everything that occurs is attributed to the syphilis, and that is not always the case. Just so, not all mental changes are necessarily sequelae of the disease, although I believe a great many of them do follow it. I am not so much surprised by the number of neuroses and psychoneuroses as I am by the paucity of them. Considering that the disease begins with what is a distinct psychic symptom, the lethargy, for instance, it is astonishing that the rest of the symptoms point to purely somatic changes, and are not distinctly psychic; but that there should be a very marked development of psychoses after the disease is not at all astonishing. If we bear just two facts in mind in regard to the disease we will be able to explain many of the things that seem rather anomalous. The first fact is that it is distinctly a toxic infection. I do not wish to draw too sharp a line between what is an infectious disease and what is a toxic disease. Looking at it as a toxic disease, there is nothing surprising that there is in its wake what are like the ordinary toxic psychoses. You will find that after encephalitis when psychoses are developed they assume a variety of different forms. The next point to remember is very characteristic of this infection, that it happens to strike the extrapyramidal system much more intensely than any other part of the nervous system, so we have the peculiar association of the special symptoms in these cases, together with the rather considerable development of psychoses.

So far as the third paper is concerned, I would like to speak of the "unusual signs." The contribution was a very interesting one, but if anyone were to ask me what the striking outcome is of our experience with epidemic encephalitis, I would say that we shall have to revise our conception of the morbid changes in some apoplectic seizures. That has not been brought out here, but it is a point of practical importance. There was a time when we saw people of middle age who were stricken with what would appear to be an ordinary hemiplegia and for which there seemed to be no sufficient reason. Under ordinary circumstances we would have made the diagnosis of hemiplegia due to thrombosis, because as a rule the attack came on without loss of consciousness, with a very gradual development of the hemiplegia. The peculiar fact is that some of these cases have cleared up with unusual rapidity, and I think I am stressing a very important point in differential diagnosis. An unusual number of these cases have recovered very rapidly, scarcely leaving a residual of the paralysis. That is not the ordinary experience in the case of hemiplegia we see due to a thrombus, so I believe that encephalitis is much more common as a cause of apoplectic disease than it is supposed to be.

I would like to call your attention to a fact that is not often referred to, which Oppenheim, one of the best neurological diagnosticians of our generation, cited many years ago that as a typical symptom of encephalitis there is an aphasia associated with a form

of hemiplegia, and a rapid recovery of that aphasia. He recognized that as a symptom of encephalitis. In the majority of cases recovery is quicker than if it were due to a thrombosis. Then again all of you probably know of people who walk into your office with double vision, of any age, and they are the people who are suspicious of being in the first stages of an encephalitis.

These are two practical points that are of the greatest importance to the general medical practitioner and possibly to some of the neurologists.

Dr. Smith Ely Jelliffe said: I feel that the three capable speakers who have preceded me have practically exhausted the field, and I can add very little. Still there are a few suggestions that come to my mind, and possibly they may be of some service. First, I may say that Von Economo is very well. I saw him this summer. He was then a gentleman farmer at his castle, and we traveled over his farm and looked at his pigs and his chickens and talked about encephalitis. He expressed great interest in the great extensions which had been made to his studies. He had gone straight on with his scientific work, and had just completed an extremely interesting work for neurologists, concerning which you will all know probably from the publishers. It is a very large, complete, and important atlas of the nervous system. It is practically a *vade mecum* of the entire nervous system, with every cell in it photographed. Thus we can hope to get to that point which Dr. Kennedy, in a somewhat illusory manner, attempts to lead us, namely, when we can put our finger on the soma, and say, there it is, the disease, possibly forgetting that the secrets of function are not seeable in structure.

To my mind the important thing that we have learned in this encephalitis epidemic, and Dr. Sachs partly indicated it, has been that we have come more to appreciate how extremely intricate and extremely complex this mosaic of the human being is. We have, finally perhaps, gotten it into our heads that the human machine is a million years old, and then some. It is not just a simple Jack-in-the-box that anybody can analyze, like a Ford car. It is so full of complexities that we will never analyze it, but encephalitis has helped us enormously in this differentiating process. Marie, in his charming introduction to Gabrielle Levy's fine study on encephalitis, spoke of the process which, exploding like a shrapnell shell, involved all parts of the nervous system helter skelter. So it has been through our study of the series of shrapnell-like excursions within the extremely complex nervous mechanism that makes up the human being that has influenced so much the subject of neurology and which has made encephalitis so interesting a problem for study, and will continue to do so.

Turning to Dr. Kennedy's paper, Dr. Jelliffe said he felt justified in commenting that there is little use in talking about the soma and the psyche as something separate. They were born together; one is as old as the other, and I think Dr. Kennedy misquoted Hippocrates and the older psychologists because they said practically the same thing. Dr. Kennedy is quite at fault in saying that psychiatry—or

analysis—is not interested in the soma. It always has been, and even too much so, it has only been of recent years that what to the somaticist is extreme that a healthy emphasis has come round to emotional or symbolic factors as showing in symptomatology and possibly causation. The psyche and the soma started together, and they cannot be separated, and it is of little service to raise a pseudo-problem that one thing is psychogenic and another somatic. What we are interested in is in his case why did that boy drink so much water; why his dyspnea; why did he have his polyuria, etc.? We are interested in the functional behavior disturbances of the man. We cannot say that he had a dyspnea solely because there was an interference in the respiratory tracts. We know that that is not so. We know that the respiratory difficulty was more than a somatic expression of pathway blocking; there was also the effort on the part of the individual to express some purpose through his behavior. What this latter was no analysis of the soma is ever going to tell us, but some analysis of the individual's personality may throw some light on it as Hughlings Jackson long ago insisted upon. In that sense I agree with Dr. Kirby and Dr. Hunt that unless we make a study of the personality we shall not understand these mechanisms.

I think Dr. Sachs was very acute in what he said about being surprised to find so few neuroses in these patients. Why? We see all kinds of so-called neurotic symptoms in a variety of pathological syndromes, but anybody who is a student of neuroses *per se* does not confuse such with the heterogeneous irregular grouping of neurotic symptoms seen in these encephalitic cases. He knows that a neurosis is more of an entity. A series of behavior disturbances is not to be called a neurosis or psychoneurosis simply because of a combination of so-called neurotic symptoms, at least not in the past twenty years. There has to be some cohesion in the genesis of the behavioristic reaction to entitle it to come within the recognized classes of neuroses and psychoses. Thus I feel that Dr. Kennedy's emphasis is slightly misplaced when he says we must pay more attention to the soma and less to the analysis of the personality. We can influence these cases a great deal through an analysis of their symptoms from the genetic standpoint, rather than being satisfied in localizing where the somatic lesion may be, interesting though that certainly is.

By way of purely personal discussion, I may add in closing that I had the pleasant and unusual experience to find at the *Deutsche Psychiatrische Verein* in Cassel that Dr. Stern, who has written a large monograph on encephalitis, had read a paper of mine on the subject, and wanted to know more about the patient. He asked me what happened to the case I had reported in the June number of the Journal of Nervous and Mental Disease, 1925. It was a case of encephalitis, with dyspnea, Parkinsonian, and all the signs that Dr. Kennedy reported in his case. I said that the patient had made an excellent recovery, and he asked me to tell him how an "organic process" like encephalitis could get well. I said, "I analyzed him." I attempted to tell him, but I shall not burden you here, beyond just this one detail: You all know perfectly well that function is going

to operate at the easiest level. This is a general economic law. The simplest form of response to a stimulation is the ordinary spinal reflex. A next higher is a more complex reflex, and the higher we go, the more complex the reflex arc activities, until we reach those higher reflex mechanisms for which Freud has used the word "sublimation." They represent the highest form of reflex activity to meet life's situations. Encephalitis hits a good deal of the cortex as well as the basal ganglia. It impinges a good deal upon the mechanisms of the Super-Ego. The individual is thus prone to short-circuit his efforts in trying to get his instinctive cravings over, but his Super-Ego has not entirely gone. The intelligence remains more or less intact, as Dr. Kirby has accented. His Super-Ego remains able to cope with the situation more or less, and what he does is to distort his wish activities over into some aberrant or disguised symbolic forms. His dyspnea, his polyuria, etc., are wish-fulfilling mechanisms operating at lower levels, but not entirely withdrawn from the censorship because the Super-Ego has not broken down.

One word concerning what Dr. Hunt said about reinfection. I am perfectly willing to agree about the chronicity of the infecting material, but I would like to emphasize that the psychological mechanism of regression may be as important a factor as reinfection. By analogy, we know that a person who has a broken arm or a broken leg turns to the easiest way of doing things, and would lock up his arm or leg by disuse. We all know how we have to use physiotherapy, etc., to make the person utilize an organ which, because of such inaction, has become below par. In the same way, then, we have to take hold of the encephalitis case from the aggressive side and make him use the organ, his Super-Ego, which is below par, and if we can once force the stimuli over the pathways, which were partly involved, we are approaching cure, and reinfection seems to be arrested.

Dr. Grimberg (closing): I would like to say one word about educating a patient suffering from a post-encephalitis syndrome. We should not forget that in such patients we are dealing with a lesion of the extrapyramidal system and the slowness of motion and abnormal attitude is due to that lesion. You cannot make impulses for voluntary motions run through that system, because they do not, their route is through the pyramidal system, which in such patients is not destroyed. The improvement noticed in such patients, by analysis or otherwise, is probably a natural remission which is frequently seen, and should not be conceived as an improvement at all. Of course, psychoanalysis may greatly influence a neurosis following an encephalitis, the same as it would influence a neurosis following any infectious disease.

Discussion: Dr. Kennedy, replying to Dr. Jelliffe, said that he had attempted in his paper to remarry Soma and Psyche—their divorce had been promulgated by the psychoanalysts who had further cast Soma into outer darkness whence it seemed profitable to recall him.

Current Literature

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Robertson, B. & Boyd, G. Toxemia of Severe Superficial Burns. [Jl. of Lab. & Clin. Med., Oct., 1923, J. A. M. A.]

The cause of death in superficial burns was made the subject of an experimental study by Robertson and Boyd. Skin, subcutaneous tissue and muscle burns were produced in anesthetized rabbits. Typical symtoms, with shock, followed the production of the burn in all cases. These facts emerge: Death from burning occurring with the first twenty-four hours is practically always due to primary shock; later than this, it is due to toxic shock. There is a toxin produced in burned tissue, in larger quantities in skin burn, which circulates in the blood, either in, or absorbed by, the red blood corpuscles, and which causes the symptoms seen in bad superficial burns, and in some cases death. Extracts of burned skin were found to be toxic. Extracts of skin burned post-mortem were innocuous. The contents of burn blisters are not toxic. That there is increased protein catabolism in burns was evidenced by the increase in the nonprotein nitrogen and urea nitrogen of the blood. Whole citrated blood from burn cases is toxic. The blood serum is not toxic. Solutions of the corpuscles properly treated are more toxic than whole blood. The toxic substance consists of two portions, one of which is thermostabile, diffusible and neurotoxic; the other is thermolabile, colloidal and necrotoxic. Chemically, the toxin consists of primary and secondary proteoses. No evidence of the production of antibodies against the burn toxin could be found.

Barber, H. W. Chronic Urticaria and Angio-Neurotic Oedema. [Br. Jl. Derm. & Syph., June, 1923; B. M. J.]

This observer considers that the majority of cases of chronic urticaria in adults, whether accompanied or not by angioneurotic symptoms, are due to sensitization to bacterial rather than to food proteins, and the same holds for asthma and associated eczematous dermatitis, such conditions being the outward signs of sensitization in which there is hereditary susceptibility and hyperexcitability of the nervous system. In bacterial sensitization the sensitivity generally develops during an acute infection. subsidence of which leaves a local focus in which the infecting organism is still active and likely to give rise to recurring symptoms of sensitization—for example, urticaria or asthma—and such foci are important for

that reason, apart from the additional possibility of direct bacterial invasion of the blood stream taking place from them. While the necessity for surgical interference is obvious in the case of abscesses of the teeth, chronic appendicitis, and nasal sinus suppuration, mere enlargement of the tonsils is no indication for their removal, this being necessary only when they are septic, the main indications being injection of the anterior palatal folds and tonsillar tissue, the presence of septic matter, and painful enlargement of the lymphatic glands. Anything short of complete enucleation of the tonsils is useless, previous incomplete operations being responsible for the development of virulent infections. The *streptococcus longus* appears to be the organism most commonly responsible, but an urticarial eruption may also depend on sensitization to the *bacillus coli,* or *staphylococcus aureus,* or other bacteria, and many of the patients give a previous history of rheumatic fever. Notes and comments of six urticarial cases are given illustrating the various sources of infection responsible for the condition.

Herrenschwand, F. v. SYMPATHETIC HETEROCHROMIA. [Kl. Wschr. Vol. 2, No. 23, 1923.]

Herrenschwand discusses sympathetic heterochromia as characterized by the presence of Horner's symptom complex and vasomotor disturbances of the face upon the side of the lighter iris. There is imperfect development of the latter in the anterior limiting layer which he believes dates back to some inhibtory cause effective before the development of the anterior limiting layer (first or second year of life). This has some relation to sympathetic paresis. He does not believe that the lighter color is due to disturbance of the pigment cells as seems to be the case in heterochromia with cyclitis and cataract.

Henry, A. CHRONIC ACQUIRED TROPHOEDEMA. [Paris Méd. July 14, 1923.]

Meige in 1898 first give the generalized conception of "trophedema." In some cases it is an isolated occurrence, in others hereditary and familial; sometimes congenital. Acquired trophedema, of which Henry records a case, may be a sequel of various infectious diseases, trauma, nervous disorders, or without definite cause. The lower limbs are chiefly affected, as a rule on one side only. The upper limbs and face are rarely involved. It is easy to distinguish chronic edema from acute cardiorenal edema, phlebitis, cachectic edema, or edema due to tabes, syringomyelia, hemiplegia, or exophthalmic goiter. The diagnosis from elephantiasis is difficult, but can be cleared up by finding *filaria bancrofti* or *loa* in the blood. The pathogeny is obscure. The condition has been attributed to disturbance of the sympathetic system or to endocrine disorder. Treatment consists in administration of a nerve tonic such as strychnine, arsenic, or sodium glycerophosphate, or pluriglandular extracts (thyroid, pituitary, ovarian, and suprarenal) associated with warm baths and massage.

Henry's case was in a woman, aged twenty-two, in whom trophedema of the right lower limb developed at the age of twenty, following an attack of erysipelas at eleven. He attributes the condition to changes in the cells of the cord in the lumbosacral region, due to the acute infection.

Wernoe, T. B. Viscero-Cutaneous Anaemic Zones. [Jl. Neur. & Psych., Aug., 1923.]

Visceral diseases, as Mackenzie, Head and others have amply shown, are frequently accompanied by cutaneous hyperesthesia. The writer describes an improved technic for their demonstration. His method is merely to expose the patient and watch the effect of cold. This is to produce reflexly a mild ischemia, most pronounced in a hyperalgesic area and from its relative pallor easily visible in a subdued light. By this method three thousand patients have been examined. The author has prepared charts showing the localization of the anemic areas in patients suffering from disease of the lungs, alimentary tract, bile passages, prostate, uterus and cardiovascular system. It is explained that the investigations apply to localization alone; they reveal nothing of the nature of the causative disease. The value of the method lies in its principle which is to observe the affected organs sensibility, expressed by the viscerocutaneous anemic zones. The objective character of the method has definite advantages.

Jourdanet, P. Echo Pruritus. [Bull. Méd., May 5, 1923.]

This author notes the fact that when an itching region is lightly scratched, other points, sometimes quite remote, begin to itch. This "echo reflex" itching is on the same side, and each time tends to appear at the same point resembling in many points Thomas' pilomotor reflex syndromes.

Horn, W. Treatment of Scleroderma by Periarterial Sympathectomy. [Zent. f. Chir., May 26, 1923; B. M. J.]

W. Horn reports a case of scleroderma treated successfully by the operation of periarterial sympathectomy. The patient was a female, aged twenty-three. Three years ago she noticed a circumscribed patch of hardness in the skin of the left forearm; within a year this spread over the whole of the left arm. Six months ago the same condition appeared at the right forearm. Various methods of treatment had been tried without avail. The skin of the left forearm and upper arm was bluish-red; the normal furrows and fine markings were absent; the skin was of board-like hardness to the touch, without elasticity, and could not be raised in folds. The changes were most marked along the ulnar border and on the back of the hand. Sensation was normal. The right forearm showed the same appearances in lesser degree. On January 24th, 1923, the brachial artery was exposed at its upper part; this was done with

some difficulty, the connective tissues round the vessels being thickened and firm. The adventitious coat was removed for a distance of 8 to 10 cm.; the artery was observed to contract during this process. Healing was uneventful. The left pulse was not palpable till three hours after operation. The arm was warmer to palpation than before operation. Two weeks later the skin began to lose its hardness, and slowly regained its elasticity, so that it could be raised in folds. The upper arm became normal; improvement continued more slowly in the forearm and hand; there is still a narrow strip along the ulna where the skin is thickened, and this has remained stationary for some time. The author suggests that some sympathetic fibers to the forearm run in the adventitia of anastomotic vessels which leave the main artery above the seat of operation. He intends to operate next upon the right brachial artery of the same patient, with a view to restoring the skin of the right forearm to its normal condition.

Kroner, K. Itching. [Klin. Woch., Feb. 26, 1924.]

Kroner believes that the itching originates in special nerves which belong to the vegetative nervous system. It has nothing to do with hyperesthesia or hyperalgesia, since it persists even after application of cocain. On the other hand, it disappears under the influence of drugs acting on the blood vessels, such as atropin and calcium. Roentgen rays or a quartz lamp also have a favorable action.

Waterston, D. Sensory Activities of Skin for Touch and Temperature. [Brain, July, 1923; J. A. M. A.]

The principal results which have been reached by Waterston include the following: (1) There is structural and experimental evidence to show that the epithelium of the skin and of certain mucous membranes is the receptor organ for tactile sensation. It is not merely a protective covering, but the receptor organ for a special form of sensation, namely, touch. (2) At single examinations hot and cold spots show a punctate arrangement; the number of such spots in an area of given size, however, differs widely in different persons. (3) On repeated examination of the same area, the number of the hot and cold spots is greatly increased, new spots appearing on successive examinations, while many of those formerly found no longer respond. These observations harmonize with the results obtained by practically all who have investigated this subject. In addition, Waterston found that under certain conditions, such as that of mild erythema, the sensation of heat can be obtained from practically all points of the affected surface at a single examination. It follows from this that all parts of the surface are potentially sensitive to heat, and that there is no structural punctate arrangement of special receptors and special nerve fibers for thermal sensation. The punctate distribution of sensitive spots found at a single examination is explained by the view that in the skin there is a constant coming and going of activity of the

different parts. Other examples of "fluctuation" are afforded by the skin capillaries in normal and certain abnormal conditions, and the same principle may form the explanation of the variations found in areas of hyperesthesia and anesthesia. To this coming and going of activity Waterston applied the term "fluctuation." The erythema produced by the mustard leaf acts on the heat-receptive areas in such a way as to abolish temporarily this fluctuation and excites all of them to receptivity.

2. ENDOCRINOPATHIES.

Keussler, H. v. Some Cases of Hermaphroditism with Especial Consideration of the Interstitial Cells. [Beitr. z. path. Anat., 1920, LXVII, No. 3.]

An attack is here made from the pathological-anatomical side upon Steinach's theory of the interstitial cells of the testicle as "glands of puberty," a theory already opposed from the standpoint of normal anatomy. Investigation into 3 cases of pseudohermaphroditism furnishes the ground for the present attack. Externally these cases presented quite feminine characteristics. In all more or less well developed interstitial cells were found in the testicles which were present, showing that these cells cannot have been determinate for the bodily form including the external genitalia.

Novak. Ovarian Organotherapy. [Endocrinolog., 1922, VI, 599.]

In judging the results of ovarian therapy, most of us have unconsciously succumbed to the familiar "post hoc propter hoc" error, states Novak who has made an intensive survey of the literature on the subject in recent times. He lebieves that if there is any field of medicine in which a healthy skepticism is urgently needed, it is that of endocrinology, and more particularly that of endocrine therapy. Incalculable harm has been done by the trashy superficiality, the ignorance, and, at times, the commercialism which are reflected in much of the enormous literature which has grown up, mushroom-like, within the past decade or so. Especially unfortunate has been the influence of several books published quite recently. We must resign ourselves to the fact that future progress in endocrinology, including, of course, organotherapy, will be a slow developmental process, as it has been in all other branches of medical science. It will mean a tedious search for truth on the part of many men from many lands. Each year will add a few nuggets of knowledge, and now and then a bigger find will spur all the searchers to renewed efforts. It cannot be said that there has been any noteworthy advance in ovarian therapy in the quarter century and more which has elapsed since its introduction. This is especially true as applied to the preparation of the commercial extracts upon which the profession as a whole is dependent. The stellar rôle in the future development of this branch of organotherapy will unquestionably be played by the biological chemist.

The time will almost surely come when we shall be able to place in the patient's circulation the specific secretions of the ovary or corpus luteum, as we now can of the thyroid, and when we shall not be obliged to strain the imagination to see good results from ovarian therapy. The foregoing words of caution from Novak, while admittedly skeptical, are none the less of great value at the present time, happily being in marked contrast to the numerous overenthusiastic reports along this line, many of which are made by careless observers and cannot stand the glare of the scientific searchlight.

Veiel, W. H., and Reisert, A. Experimental Adrenalin in the Diabetic. [D. Arch. f. klin. Med., 139, Nos. 3, 4.]

The authors present certain facts obtained from the employment of injections of adrenalin (1 mg. suprarenin) which by testing the sensitivity of the vegetative nervous system give light upon the clinical situation in diabetes and also generally upon the condition of hypertonia. In relation to diabetes they find new facts in regard to the elimination of sugar through the kidneys and in regard to acid formation in the organism. The normal glycemic reaction shows itself as the expression of an unimportant disease condition which may be bound with glycosuria or not. The glycemic stimulus curve on the contrary is a sign of actual severe diabetes, always a serious disease. The liver cells act under an increased nervous drive for their innervation is here abnormally involved. Yet the mobilization of glucose, its secretion, its regeneration in the blood bear testimony that the liver itself remains intact for its function. The same increase in stimulus is present also in hypertonia but in it a marked vasoconstrictor reaction exists while in diabetes the regulatory action of the autonomic nerves, perhaps also the influence of the central nervous system, diminishes this excitement. Wherever cerebral diseases were demonstrated it was found that the glycemic reaction was delayed. It is possible, the authors think, that both the autonomic and the sympathetic vegetative nervous centers are equally stimulated in such cases. It is in part the hyperglycemic demand which directs the glycosuric reaction but it is more especially the autonomic condition of excitement. There is furthermore an acid forming reaction. Usually in 2 hours the acidification of the urine has reached its height. Ketonuria may also appear.

Banting, F. G., et al. The Pancreas and Carbohydrate Metabolism. [Am. Jl. Physiol., LXII, 559 (Nov. 7, 1922). Ed. J. A. M. A.]

As it has been demonstrated experimentally that injection of suitably prepared extracts of the pancreas can prevent or reduce the hyperglycemia which results after extirpation of sufficient pancreatic tissue, it has become desirable to ascertain the mechanism whereby this interesting and important result is accomplished. Is the potency restricted alone to those instances of increased content of blood sugar associated with inadequate

pancreatic function and therefore in a sense specific for pancreatic diabetes, or is it more general in its manifestation? Light has been thrown on this question by the recent studies of the group of physiologists at the University of Toronto who are engaged, under the leadership of J. J. R. Macleod, in the extensive investigation of the control of abnormalities of carbohydrate metabolism. Banting et al. have just reported that when an animal has received suitable doses of pancreatic extracts to which the name of "insulin" has been given tentatively, a variety of procedures which ordinarily provoke hyperglycemia and often glycosuria fail to do so. In other words, the pancreatic hormone, if we may so designate it for the present, may in some way inhibit the development of hyperglycemia in animals subjected to conditions, such as piqûre of the fourth ventricle of the brain, dosage with epinephrin, and asphyxia, which otherwise cause it. All the facts now available, therefore, point to the conclusion that the action of the hormone on carbohydrate metabolism is fundamental. It apparently matters not whether there is much or little glycogen stored in the tissues. Furthermore, since the pancreatic hormone influences the excretion of ketone substances, the mobilization of fats and the respiratory quotient, the behavior must be interpreted to mean that the effective component is essential in the regulation of the series of intermediary metabolic changes that culminate in the complete utilization of both fat and carbohydrate. One is impelled to ask whether the hormone actually stimulates glycogenesis to the extent that it takes glucose away from the systemic blood. Only further experiments can furnish a correct answer.

Labbé, Classification and Therapeutics of Diabetes Mellitus. [Rev. Méd. de la Suisse Romande, May, 1922.]

The author here reviews the present state of knowledge of this disease, and, while criticizing the older classifications, can find none that is entirely satisfactory. Diabetes is a pathological condition in which the system has wholly or partially lost the power to utilize carbohydrates obtained from food, resulting from alimentary metabolism, or from tissue destruction. Its chief characteristic is a permanent difficulty of "glycoregulation." He adopts H. Labbé's classification: I. Diabetes without "nitrogen denutrition," in which there is only difficulty of carbohydrate metabolism. II. Diabetes with "nitrogen denutrition," where the failure of carbohydrate metabolism is associated with failure of protein and hydrocarbon metabolism, representing the gravest factor. Class I corresponds to those formerly described as "fat" or "arthritic" diabetics. Their glycosuria is usually moderate, but may be increased by overfeeding. The amount of sugar alone does not indicate the severity, and varies with the hydrocarbon ingestion, but the daily loss of sugar in the urine is always less than the quantity of carbohydrates taken—that is, the patient maintains some capacity for utilizing them. That degree of tolerance indicates roughly the gravity of the case. A more exact estimate of

ability to oxidize carbohydrates is to reduce them till the glycosuria has disappeared, and then to increase them until sugar reappears. This limit of tolerance may be maintained for years, but may be varied—for example, by the occurrence of an acute infection. Nitrogenous metabolism is unchanged. II. Diabetes with "nitrogen denutrition," formerly termed "wasting" or "pancreatic diabetes"—a bad term, for the pancreas is not more often diseased in these cases than in Class I. The quantity of sugar excreted is greater than that of carbohydrates ingested and the excess is provided by protein and hydrocarbon metabolism. Glycosuria never disappears when carbohydrates are withheld. The failure of protein metabolism is shown in two ways. (a) There is a constant or intermittent loss of nitrogen, averaging 1 to 3 grams daily. The nitrogenous equilibrium is destroyed, and the patient's fate is inevitable. (b) Nitrogen metabolism is incomplete, by-products—ammonia bases, amino-acids, creatin, etc.—appear. Blood analysis reveals the breakdown of nitrogen metabolism. Acidosis is always present and is progressive. This form of diabetes often attacks thin patients, and is never, apparently, due to overfeeding. It is occasionally hereditary and always fatal, though sometimes arrested for long periods. Between these two classes are those cases which show moderate and transient "nitrogen denutrition" and acidosis. Prognosis should be founded not only on the physiopathological classification but on a knowledge of the evolution of the disease. In regard to therapeutics, there is no specific treatment; arsenic, pancreatic extracts, alkalis, and natural mineral waters act favorably in associated troubles, in hepatic congestion or cirrhosis, in pancreatic insufficiency, and on the general health or when acidosis is imminent. Regulation of diet is the only efficient treatment, but each form of the disease has its special indications. In Class I the diet should be mixed, with reduction of carbohydrates below the tolerance limit, and meat should be reduced in quantity, lest serious acidosis supervene. To produce a rapid result, the patient may be ordered a green vegetable diet; this has yielded excellent results. In the grave forms of Class I, when glycosuria persists in spite of this diet, the patient should be ordered to fast for two to four days. The author has published cases which show this treatment to be both harmless and very beneficial. In Class II a mixed diet, with reduction of carbohydrates in cases with little or no acidosis, helps to maintain nitrogenous equilibrium and to reduce glycosuria. Meats should be reduced to a minimum (vide supra). The "milk cure" and "potato cure" have been useful in transient acidosis, but usually increase glycosuria. Von Noorden's "oatmeal cure" is sometimes very useful when coma threatens. Leguminous vegetables offer the same advantages; on account of their large protein content they check nitrogen waste, their protein is better borne than that of meat when acidosis is imminent; 1,200 to 1,500 grams per diem of green vegetables or salads neutralizes acids and relieves hunger. Vegetables should be cooked in milk and only slightly seasoned. Butter, oil, or fat bacon may be added, and the diet may be

enriched with eggs, cheese, milk and gluten bread. Occasional fasting is often beneficial, but if prolonged or too frequently repeated it augments tissue waste and hastens the end. In the milder cases treatment relieves symptoms, but only masks the defect in metabolism; the patient should be warned that only by strict adherence to the diet suitable to his carbohydrate tolerance can improvement be maintained. In the severer forms unhoped-for results often follow (even in children) the green vegetable and fasting treatments. The results of the "Allen treatment" have been somewhat exaggerated, but a groundless fear of acidosis should not prevent its trial in suitable cases. "While we can ameliorate the condition and retard the evolution of the gravest symptoms by physiologically sound dietetic treatment, we cannot pretend to cure diabetes. [B. M. J.]

Bliss, S. W. Effects of Insulin on Diabetes Dogs. [Jl. of Metab. Research, II, No. 3.]

The report of Banting and Best concerning the effect of pancreatic extract on totally depancreatized dogs is confirmed by Bliss. Also the observations on the occurrence and symptoms of hypoglycemic collapse following overdosage of insulin, and the susceptibility of depancreatized dogs to this condition. Heavy glycosuria and hyperglycemia were abolished in a partially depancreatized dog by 5 units of insulin. A partially depancreatized dog dying of diabetic coma was not saved by the injection of 16 units of insulin, though the blood sugar was reduced nearly to normal, the acetone nearly disappeared, and no chemical reason for death was apparent. The plasma bicarbonate fell progressively to death and was entirely independent of the acetone values, the insulin injections, and the blood sugar changes. Traces of glycogen were found almost equally in the liver, heart and skeletal muscle at necropsy. It is assumed that the insulin treatment fails in advanced coma because unknown secondary changes prove fatal in spite of the clearing up of the primary diabetic disorder.

Joslin, Elliott P. Decreasing Diabetic Mortality: Increasing Incidence of Glycosuria. [Boston Med. and Surg. Journ., June 8, 1922, p. 761.]

Joslin states that in the United States the highest recorded mortality from diabetes—that is, 17.5 per 100,000—was reached in 1915. In the subsequent quinquennium there has been a decrease, the lowest figure being 14.9 in 1919. From 1880, when the deaths recorded were 2.8 per 100,000, the rate rose steadily until 1915, no retrogression in the curve exceeding 0.2 per cent. "The decrease in diabetic mortality is by no means wholly attributable to a lessened frequency of the disease. It reflects better treatment." In the period 1898–1913 the average duration of life in fatal cases in Boston was 3.3 years. In 1915 the average was 4.3 years, and in 1920 it rose to 5.3 years. On the other hand, the records of the Metropolitan Life Insurance Company (*Statistical Bulletin*, No-

vember, 1921) show that whereas in 1919 sugar was found in 0.6 per cent of specimens examined, the ratio in 1921 was almost doubled—that is, 1.1 per cent. Joslin cannot accept the theory that the increase in glycosuria is due to increased sugar consumption; he quotes statistics showing that in 1919 and 1921 the sugar consumption per capita was almost identical, although in 1921 the percentage of cases of glycosuria discovered was nearly double that of 1919. In his own practice, 300 successive case histories of "supposedly non-diabetics" showed sugar present in 50, a rate of 165 per 1,000. None of the patients suspected glycosuria, and only one case was "frank diabetes." Thus, while the Metropolitan Life Insurance Company's statistics showed 11 cases per 1,000, the writer's statistics for the same year yielded 165. This may be explained by the fact that the Insurance Company's cases were apparently healthy, while the writer's patients were ill.

II. SENSORI-MOTOR NEUROLOGY.

6. ENCEPHALITIS.

Doerr, R., and Berger, W. Bacteriology of Epidemic Encephalitis. [Schweiz. med. Woch., Vol. LII, No. 35, p. 862.]

These authors claim to have succeeded in isolating two new strains of epidemic encephalitis virus from the brains of two persons who had died from the disease. One of the strains could be used for cross-immunization with herpes virus.

Salmon, A. Paradoxic Postencephalitis Kinesia. [Rif. Med., XXXIX, No. 6.]

Certain postencephalitic Parkinsonian patients are able sometimes to dance or ride the bicycle whereas they are stiff and seem to have scarcely any control over their legs at other times. He points out the difference between the Parkinsonian symptoms that follow epidemic (lethargic) encephalitis and those of senile Parkinson's syndrome. In the postencephalitic immobility, the mental factor seems more prominent than the muscular rigidity. It seems to be more of a disinclination to move than an inability to move. It has been extensively observed. Naville of Geneva (abstracted in Jl.) calls it bradyphrenia; Hesnard and Verger of Bordeaux (abstracted in Jl.) call it mental viscosity, bradykinesis. The subjects seem incapable of attention, thought or desire. The author erroneously assumes an emotional center from his quite insufficient analysis of the situation.

Parsons, A., MacNalty, A. S., and Perdrau, J. R. Report on Encephalitis Lethargica. [Reports on Public Health and Medical Subjects, No. 11, Ministry of Health, pp. 344. Med. Sc.]

The scope of the report is indicated by its subtitle, "an account of further inquiries into the epidemiology and clinical features of the

disease; including an analysis of over 1,250 reports of cases notified in England and Wales during 1919 and 1920, together with a comprehensive bibliography." In addition, there is a preface written by Sir George Newman, and sections on the pathology and bacteriology of encephalitis. Thus the report contains a wealth of information on every aspect of the disease, and will become a valuable work of reference on the subject.

Within the scope of a short notice but a few of the salient features can be referred to, and we will not attempt any appreciation of the pathological sections here, but will leave them for discussion elsewhere. In the epidemiological section, Dr. Parsons concludes that there is no justification for the view that influenza and encephalitis lethargica are in any way related, or that an attack of the former disease predisposes the individual to the latter. Further, there is no convincing evidence connecting the so-called "epidemic hiccough" with encephalitis. In the matter of age incidence, although no age is found to be exempt, the second decade of life seems to provide the majority of cases. Fifty cases occurring in pregnant or lying-in women are reported. In these circumstances every clinical type of the disease has been observed, but stress is laid upon the frequency of profound psychical disorders and of somatic symptoms of an active character, such as acute choreiform manifestations. There seems to be no special liability to miscarriage under these conditions. Three cases of encephalitis neonatorum ending in recovery and two fatal cases have been reported, the result of the disease in the pregnant mother.

In the clinical section, Dr. Parsons has utilized MacNalty's clinical grouping into types as follows: I. Cases with general nervous disturbance but with no focal symptoms. II. Cases with both general and focal symptoms. These are subdivided into: (a) Cases with third nerve palsies; (b) cases with brain stem and bulbar symptoms; (c) cases with symptoms referable to an affection of the long tracts; (d) cases with cerebellar symptoms; (e) cases with symptoms referable to the cerebral cortex; (f) cases with spinal cord symptoms; and (g) cases with peripheral nerve symptoms. III. Mild cases. For the description and placing of individual symptoms, the method of classification first formulated in this journal (1920, III, 51) and later amplified in brain (1920, XLIII, 197) is used. It is based upon Hughlings Jackson's teaching on "positive" and "negative" symptoms, and is complementary to the anatomical scheme of MacNalty.

The mode of onset of the disease is discussed and analysis of the available records indicates that the commonest initial symptoms are, in order of frequency, headache, lethargy, vomiting, diplopia, changes in disposition, fever, diffuse pains and malaise, constipation, and defective vision. While a subacute onset is the rule, acute and even sudden onset has been recorded. The symptoms of the fully developed disease are

analyzed in detail, but there are short sections on relapses, complications, sequelæ, treatment and prophylaxis.

Over 1,250 case records have been analyzed in the making of the present report, but quotations and some of the statistical tables make it clear that the information has been of very unequal value. Accounts have been received from the provinces of so-called mild forms of encephalitis, in which there is no apparent justification for the diagnosis, unless our conception of the disease is to be so wide as to become wholly indefinite. This type of difficulty is inherent in the compilation of reports based upon information from sources of unknown value, and while the experienced clinician will readily detect the sources of fallacy arising in this way, the reader unfamiliar with encephalitis lethargica is likely to gain a somewhat loose and erroneous notion as to what it is reasonable to regard as a case of the disease.

In the matter of clinical classification it is probable that the two complementary schemes adopted in the report provide as useful a working method as is at present available. It is now recognized, in this country, if not in France, that a purely clinical basis of classification is useless and leads to infinite confusion, owing to the kaleidoscopic course which any given case of the disease may run; nevertheless, MacNalty's anatomical scheme is capable of considerable improvement. Thus, reference to his groups under Type II shows that there is no place for that large group of cases presenting a clinical picture akin to that of paralysis agitans, in which the basal ganglia and subthalamic nuclei appear to bear the brunt of the disease process. Further, we do not believe that his group (c) has any independent existence. All the cases under this heading must belong primarily to one or other of groups (b), (d), (e), or (f). In respect of Type III, which includes so-called "mild cases," the experience of the past two or three years indicates that we must materially modify our notions as to what we mean by a mild case. MacNalty appears to use the term in an extremely narrow sense, namely, as applied solely to the initial constitutional symptoms. A very large number of patients now presenting some variety of paralysis agitans symptom-complex date their trouble from an apparently trivial illness, which was diagnosed as "influenza," "a cold," a "nervous breakdown," or as "hysteria." To regard such cases as mild is absurd, for it is here that encephalitis presents its most crippling effects. Moreover, since weeks or months may elapse between the initial ailment and the development of Parkinsonian symptoms, we can scarcely be justified in regarding a case as mild within a year of its onset. This brings us naturally to the question of residual nervous symptoms in encephalitis. Evidence is now accumulating to the effect that it is extremely rare for patients who survive the acute stage of encephalitis to be restored to normal health. Recovery in any but the surgical sense of the term is the exception. The commonest of all sequels, occurring in over 40 per

cent of cases according to one authority (cf. Medical Science, 1922, VI, 311), is the development of some variation of the paralysis agitans syndrome. On this question of end results the report is both inadequate and misleading. Paralysis agitans as a sequel is dismissed in a footnote, though its occurrence is now a commonplace of clinical neurology.

Nevertheless, by correlating the information obtained from this and other sources on the after effects of encephalitis, we gain some interesting information as to the nature of certain of the striking motor symptoms of the disease.

In the classification of clinical forms of encephalitis referred to earlier as having appeared in this journal and elsewhere in 1920, we included under the heading of "positive symptoms" not only phenomena of "release" such as tremor, rigidity, and athetosis, but also such "irritative" manifestations as Jacksonian fits, the so-called "myoclonic" twitchings of muscles and of parts of muscles, and also the acute chorea seen in some cases. The notion of "irritation" as a factor in the production of positive symptoms is at present out of favor, partly on account of the abuse of the term during the last century, partly because it is not understood, but more largely on account of the teachings of Jackson. Nevertheless, the clinical study of cases of head injury and certain physiological observations on the oxygen needs of nervous tissue have made it quite clear that the conception of "release of function" does not explain all positive symptoms, and that we have also to take into account the question of abnormal excitability of nervous tissues as an important factor. It was suggested that the acute chorea of encephalitis, Jacksonian fits, and myoclonic contractions were phenomena of this order. Probably no one would dispute this in the case of Jacksonian fits. However, the conspicuous absence of all three symptoms among the residual effects of encephalitis confirms this view of their origin. On the other hand, the manifest release symptoms, tremor, athetosis, and muscular rigidity are common sequels. Recent clinical and pathological work on the corpus striatum has led certain authorities to the conclusion that involuntary movements of the chorea and athetosis varieties arise as release symptoms in the pallidum when a destructive lesion of the striatum (putamen and caudatus) releases this structure from normal control. In a word, the involuntary movements in Sydenham's chorea and Huntington's chorea are both regarded as phenomena of release. There is no difficulty in accepting this view of athetosis and of the movements of Huntington's chorea, but it is impossible to credit that the wild motor unrest of acute Sydenham's chorea in an adult, or of the acute chorea of some cases of encephalitis can have this origin, especially when we take into account the associated mental excitement. To stand by the bedside of such a patient is to be speedily convinced of the hopeless inadequacy of any theory of pallidal or other release as an explanation of what we see. The course of the condition

points in the same direction. It would seem reasonable to conclude therefore that the study of such diseases as Sydenham's chorea and encephalitis lethargica, especially of the end results of the latter, may help to serve as a corrective of the deceptive simplicity of theoretical notions based upon pathology of certain chronic nervous diseases. We believe that the careful study of acute nervous maladies and injuries is of greater importance in this connection than is commonly realized. Apart, therefore, from its obvious value as a source of information on a particular disease, the report under review has an interest for those interested in neurology in the widest sense of this term. [F. M. R. Walshe.]

Winther, K. Psychic Sequels of Encephalitis Lethargica. [Uges. f. Laeg., Feb. 1, 1923.]

The psychic after effects of epidemic encephalitis are here considered in detail and the author has come to the conclusion that there is no relation between the acuteness and the severity of the primary disease and the onset and character of the psychic sequels. As a rule the psychic disturbances follow directly after the acute stage. There were four cases in which the encephalitis was followed by lassitude, lack of initiative, apathy, faulty memory, and incapacity for work. There were four other cases in which the dominant character of the psychic disturbances was emotional instability. In all these eight cases there appeared to be a tendency towards recovery, although the duration of the symptoms ranged from six months to three years. Turning from adults to children, the author insists that when the disease attacks children between the age of five and puberty, and the mind is affected, the psychic phenomena are amazingly uniform, and are suggestive of a psychopathic degeneration. Owing to such troublesome symptoms as libido precox, these cases are very difficult to manage at home, and are badly in need of institutional supervision. The prognosis for these cases is, indeed, bad, and most of the changes observed by the author were for the worse. Of a total of twenty-five cases of epidemic encephalitis observed at one hospital in the period 1918–22, eleven terminated fatally in the acute stage. Two survivors could not be traced, and of the remaining twelve patients not one was well six months after the illness. Two years after the illness five were still suffering from severe and three from slight psychic disturbances. The clinical syndromy was quite variable, eight of his thirty-one patients presented confusion, delirium or stupor during the acute phase. In four acute phase was followed by a state of apathy and inability to work, which lasted for from six months to three years. In four others this mental state was accompanied with irritability and emotional instability. This stage lasted from six months to two and a half years. The trend was towards final complete recovery in these two groups. In two men, aged about fifty, a manic-depressive condition followed the acute phase, and incapacitated the men for a

year, with final recovery. Two men in the twenties had apparently recovered from the encephalitis, but two years later developed maniacal excitement and motor agitation. This condition gradually subsided in a month, but one was left with a complete change of character, irritable and thieving. The connection with the encephalitis two years before was evident from the bilateral paresis of accommodation and insufficiency of convergence, which testify to epidemic encephalitis, as well as the severe motor symptoms suggesting chorea. The complete Korsakoff syndrome developed in one man, aged forty-seven, four years after epidemic encephalitis. In six cases of the disease in previously normal children, the acute phase was followed by symptoms of psychopathic degeneration. They have persisted unmodified for two years to date. Probably many of the inmates of our asylums have a history of epidemic encephalitis in childhood although the disease may have escaped recognition at the time. The children with these congenital and acquired degenerative psychopathies should be placed in a special institution where they would be under strict supervision and teaching. Kleptomania is common among them. In Winther's twenty-five cases of epidemic encephalitis, 1918 to 1922, eleven patients died in the acute stage and he has lost track of two. Of the other twelve, none had recovered within six months; severe mental disturbances were still evident two years later in five, and two others presented disturbances of a milder form.

7. TESTS, REFLEXES, SYMPTOMS.

Loewi, O. Transmission of Nerve Action. [Klin. Woch., April 15, 1924.]

The accelerator nerve requires a stronger stimulus than the vagus. Therefore, Loewi obtains exclusively vagus action with the perfusing fluid from those hearts in which he uses slight stimuli.

Freeman, W., et Morin, P. Mesencephalic Reflex Reactions. [Rev. Neurol., 1924, I, 158; Med. Sc.]

The authors confirm the existence of the tonic reflexes of Magnus and de Kleijn in man. In their theoretical consideration of these phenomena, however, they confuse phasic with postural reflexes and adopt the erroneous view that the neck reflexes they describe are mesencephalic in origin. This is not in accord with the views of Magnus, which the authors nevertheless quote in the text of their paper.

Bailey, P. A New Principle Applied to the Staining of the Fibrillary Neuroglia. [Jl. Med. Res., September, 1923.]

While working with neutral ethyl violet-orange G as a stain for eosinophilic granules in the pituitary body, it was noted that fibrin was always stained heavily. Knowing that all stains for neuroglia fibrils stain

fibrin at the same time, the possibility of this neutral dye as a stain for neuroglia fibrils was investigated. The following method was the result: (1) Fix fresh tissue in Zenker's fluid; (2) embed in paraffin; (3) cut sections 5μ thick and mount; (4) remove paraffin and pass to water through alcohol and iodin in the usual way; (5) place for three days in a 3 per cent aqueous potassium bichromate solution; (6) rinse and place in a solution of neutral ethyl violet-orange G for twelve hours; (7) blot and agitate quickly in anhydrous acetone; (8) place in toluol for a few seconds; (9) flood slide with pure clove oil; (10) differentiate in clove oil three parts, 95 per cent alcohol one part; (11) rinse in pure clove oil; (12) toluol; xylol half a dozen changes; (13) mount in balsam.

By this procedure the neuroglia fibrils appear dark violet against an orange background. The nuclei, fibrin, and red blood corpuscles are stained at the same time. [Author's abstract.]

Holmgren, I. A Frontal Reflex Associated with Certain Cerebral Lesions. [Acta med. Scand., 1923, LVII, 616–22; Med. Sc.]

The reflex is associated with cerebral lesions. In the majority of cases a vascular lesion involving the lenticular nucleus and associated with hemiplegia was in question. It was also observed in cases of Jacksonian epilepsy, meningeal hemorrhage, and encephalitis. It is elicited by a horizontally directed stroking pressure across the forehead, and consists in bilateral elevation of the eyebrows and wrinkling of the forehead. The contraction is relatively slow and passes slowly away. It is never present in the absence of a cerebral lesion, and is not constant even when a lesion is present.

Babinski, J. Defense Reflexes. [Rev. Neur., August, 1922.]

J. Babinski, in a paper on the defense reflexes, opens by indicating that diverse names have been needlessly given to one and the same phenomenon, names such as antagonistic reflex of Schäfer, the leg phenomenon of Oppenheim, reflexes of spinal automatism of Marle, the mass reflex of Head and Riddoch. This phenomenon is the motor reaction which follows certain sensory stimuli. Thus, scratching the sole of the foot with a pin, or pinching the skin of the foot or lower leg induces triple flexion, namely, at the ankle, knee, and thigh joints. Not only are there other means of exciting this reflex but the reflexogenous zone and the amplitude of the resulting movements respectively vary in extent and degree. First, concerning the connection between the defense reflexes and the well-known toe phenomenon, the author holds that this is not unbreakable; the two do not fuse completely. Secondly, he says that all defense reflexes are certainly not pathological. Chief of all is the fact that in the normal subject the muscular contraction is rapid and brief, in the diseased slow and sustained. Attention is next drawn to an isolated

sign. If flexion of the foot alone be obtained by excitation of any part other than the sole of the foot, thus by pinching the dorsum of the foot or the lower leg, then a morbid condition can be affirmed. This the author calls the sign of the flexion reflex of the foot and he considers that it is closely related to the toe phenomenon; both point to interference with the pyramidal tract. He goes on to show that the condition of the defense reflexes may aid in the localization of a spinal lesion and be a guide to its intensity; thus very active defense reflexes suggest relative integrity of pyramidal tracts. Again, in the first phase of spinal compression the toe extension sign may be present and the defense reflex absent.

Stiefler, G. Basal Joint Reflex of C. Mayer. [Zentralbl. f. Neurol. u. Psychiat., 1922, XXX, 397; Med. Sc.]

Mayer's phenomenon is certainly a true proprioceptive reflex. It was found in 96 per cent of 2,000 healthy adults, and 97 per cent of 6,000 adults with functional disease of the nervous system. At the age of three years it was present in 9.5 per cent, at four in 57 per cent, at six in 93 per cent. In chloroform narcosis it disappears before the corneal and abdominal reflexes and reappears long after them. It was obtained in all the patients with hysterical paralysis of the arm, and was always lost in genuine epilepsy during and immediately after the attack. It is diminished or lost in patients with disease of the pyramidal tract or of the afferent or efferent arcs on which the reflex depends, but is present in functional and extrapyramidal disease. It gave a clear indication of involvement of the pyramidal tract and of the side of the brain affected in seven cases where Babinski's sign was absent. In a few cases a crossed response was obtained from the healthy side. The reflex has a high clinical value and should be investigated in every case of nervous disease.

Martius, F. The Arndt-Schulz Law. [Münch. med. Woch., August 3, 1923; J. A. M. A.]

Martius extols the importance of this law, as a tribute to Schulz on his seventieth birthday. According to this law, every drug has a stimulating action in small doses, while larger doses inhibit, and much larger doses kill.

Katz, D. Nature of the Vibration Sense. [Münch. med. Woch., June 1, 1923.]

A deaf-mute can palpate the vibrations of the vocal cords and secure an image of sound making. According to this study this is not due to a mental abstraction of auditory and tactile elements, but is due rather to a specific vibration sense. The sense of vibration is a special sense perception, and not a modification of pressure or touch perception; like the sense of hearing, it gives information on the vibratory state of bodies.

8. NEUROSYPHILIS.

Tixier and Duval. Treatment of Nervous Syphilis by Subcutaneous Injection of Arsenical Compounds. [Bull. et Mém. Soc. Méd. des Hôp. de Paris, June 9, 1921.]

This paper records the treatment of several cases by subcutaneous injections of sulpharsenol, or "914," with satisfactory results. The initial dose of sulpharsenol was 0.06 gram, and the final dose 0.6 gram, the dose being increased 0.06 gram at each injection. The injections were given at first every two days, then every three, four, and five days. Sulpharsenol was given every two days in doses of 0.10 to 0.15 gram in 1 to 2 c.c. of a 1 in 100 solution of novocain. The general improvement following injection was, it is stated, comparable to that observed in malaria after intramuscular injection of quinine, and the nervous symptoms—such as headache, vertigo, disturbance of gait, and mental disorder—were favorably affected. The arsenical treatment was followed by a series of intramuscular injections of grey oil.

Bruusgaard, E. Neurosyphilis. [Norsk Mag. f. Lægevidensk., LXXXI, 76–84.]

Bruusgaard's main theses may be classified thus: (1) It is certain that an inadequate, unsystematic course of salvarsan treatment may be harmful, as it often gives an atypical turn to the disease, notably neuro-recurrence. (2) In the case of primary syphilis with a positive Wassermann, specific treatment must be pushed vigorously, and prolonged observation is required before the success of abortive treatment can be claimed. (3) In cases of primary syphilis with a negative Wassermann, modern specific treatment can almost invariably abort the disease and effect a complete cure. (4) If early cases of neuro-recurrence are traceable to inadequate specific treatment, then energetic, systematic treatment should banish this complication. In support of hypotheses (1) and (4), B. gives the following statistics from the dermatological department of the Rigshospital in Christiania. Since 1912, 630 cases of recent secondary syphilis were observed, and among them were ten cases of neuro-recurrence. After giving details of each of these cases, he remarks that common to all was the inadequacy of the specific treatment. In some cases only a few injections of salvarsan or neosalvarsan had been given at long intervals. In others numerous injections had been given, but each injection had been small. At this point the author digresses, saying that his predecessor, Caesar Boeck, objected to the use of mercury in early syphilis because its course was only modified, and not always to the benefit of the patient. As for his fourth hypothesis, he finds it supported by the fact that since he adopted, in 1915, energetic, systematic treatment of early syphilis, he has only once seen a case of neuro-recurrence among 420 cases of early secondary syphilis. His treatment for men and women was different. The former were given salvarsan com-

bined with injections of salicylate of mercury, the latter neosalvarsan combined with mercurial inunctions. The first course of treatment was the most energetic on the assumption that it might also be the last. Treatment was continued long after the disappearance of clinical symptoms and the development of a negative Wassermann. The total amount of salvarsan given in one course was often 5 to 6 grm., and of mercury up to 2 grm. For women the total was 6 to 10 grm. of neosalvarsan, and often as much as 250 to 300 grm. of mercurial ointment. The author pushes the mercurial treatment of women more than that of men because the action of neosalvarsan is far less effective than that of salvarsan. Referring to the one case of neuro-recurrence in this series, the author confesses that, had he but taken the precaution of examining the cerebrospinal fluid before the patient's discharge, this disaster might have been avoided. [Med. Sc.]

Holland. Neurosyphilis. [Norsk Mag. f. Lægevidensk., LXXXI, 84–7.]

Discussing the prognostic significance of changes in the cerebrospinal fluid in syphilis, Holland regards globulin and an increased number of cells as of doubtful significance, for these two factors have not been adequately checked by control examinations in other diseases and in healthy persons. He attaches more importance to Wassermann's reaction. Lumbar puncture in ninety-two cases of recent syphilis was undertaken, the material, after the exclusion of six cases of congenital syphilis, being grouped in two classes. The first included forty-four consecutive cases before the institution of treatment. In one case all three tests (globulin, cells, Wassermann) were positive, the patient being a man of forty-five, with headache as the only clinical symptom. In three other cases, one of the tests was positive, and in one case two of the tests (globulin and cells) were positive. The second series of cases included forty-two patients on whom lumbar puncture was performed because clinical evidence, such as headache, suggested morbid changes in the cerebrospinal fluid. While only five of the patients in the first group showed morbid changes, seventeen, or 42 per cent, showed morbid changes in the second group. Holland gives these findings with reserve, admitting that they may prove instructive only in conjunction with similar investigations by other workers. [Med. Sc.]

Dreyfus, G. L. Constitution of the Cerebrospinal Fluid in Syphilis of the Nervous System. [München. med. Wchnschr., LXVII, 1369.]

A summary of the author's long-continued investigations into the relation of the state of the cerebrospinal fluid to the prognosis and treatment of cerebrospinal syphilis. A pathological cerebrospinal fluid in the early stages of syphilis may revert to the normal without treatment; from the latent stages onwards, however, such a fluid is an index of

grave progressive processes in the C.N.S. This is particularly so when the W.R. is positive in high dilutions. The author has observed in many cases a progression from cerebrospinal (interstitial) to generalized encephalitis (G.P.I.). Eighty per cent of seventy-two cases of early syphilis without obvious nervous signs show pathological cerebrospinal fluids (including slight increase of pressure as such). Most of these become normal on treatment, but some become abnormal again, and therefore it is essential in every case of syphilis to repeat lumbar puncture about twelve months after the end of treatment. The first course of treatment is vastly more important than subsequent courses for preventing relapse. Among 260 "latent" syphilitics, without nervous signs, at all periods of infection 17 per cent had abnormal cerebrospinal fluids. Cases of cerebrospinal syphilis (371 cases) require intensive treatment in proportion to the degree of abnormality. Many cases can thus be brought to normal, but others not. In tabes (327 cases) a normal cerebrospinal fluid may be found, but this does not necessarily indicate a cure of the process, and treatment should nevertheless be carried out.

The short summary of the author's work indicates again that no case of syphilis can be properly controlled or treated without the information supplied by repeated lumbar puncture. [Med. Sc.]

Hassin, G. B. Intraspinal Therapy. [Am. Archives of Neur. & Psychiatry, June, 1920.]

The author here states that when there are evidences of parenchymatous degeneration intraspinous therapy has no rationale. In those cases in which the subarachnoid space is chiefly implicated, as in cerebrospinal meningitis, the injection is justified. As used in very small doses, however, therapeutic results cannot be expected. The favorable reports of the Swift-Ellis method of treatment he believes can be explained by the intravenous injections rather than the intraspinal ones.

Schou, H. J. Nerve Lesions in Early Syphilis. [Hosp.-Tid., LXIII, 57–9; Med. Sc.]

In a preliminary report, Schou reviews his findings in about 800 cases of syphilis of less than three years' standing. About 1,200 examinations of the cerebrospinal fluid was made, the number of cells, the amount of the proteins, and Wassermann's reaction being investigated. The cases were classified according as they had been treated or not, and according to the stages of the disease. There were 491 cases of recent syphilis in which absolutely no treatment had been given. Among them were 56 cases of primary syphilis with a positive Wassermann (blood), and in 12 per cent morbid changes were found in the cerebrospinal fluid. The same percentage was found in 75 cases of primary syphilis in which Wassermann's reaction (blood) was negative. This percentage rose to 23 in 300 cases of secondary syphilis, and to 39 in 41 cases of syphilis of six to twelve months' standing. The cerebrospinal fluid showed morbid

changes in 27 per cent of the 15 cases of one to two years' standing. Schou notes as remarkable that most of the changes observed in the cerebrospinal fluid coincided with the second half-year of the disease. The changes found in the cerebrospinal fluid were, in the order of their frequency, pleocytosis, globulinosis (25 per cent), a positive Wassermann (21 per cent), and albuminosis (14 per cent).

Altogether, 133 patients with primary and secondary syphilis were examined by a neurologist, who found partial or complete loss of the abdominal reflexes in 9 per cent, exaggeration of the patellar reflexes in 20 per cent, and sensory disturbances of the trunk and lower limbs (of a uniform, radicular type) in from 5 to 10 per cent. Among patients with the triad: absence of patellar reflexes, lively tendon reflexes, and slight sensory disturbances, the cerebrospinal fluid showed morbid changes in 60 to 90 per cent, *i.e.*, they were three to four times as common as in syphilitics not showing this triad. There would, therefore, seem to be some connection between spinal meningitis and nerve symptoms. In about one-third of the cases of primary and secondary syphilis headache was present and was almost invariably associated with an increased intraspinal pressure. Optic neuritis was found in 3 per cent of 443 cases of recent syphilis, and disturbances of the auditory mechanism in about 14 per cent of 135 cases. Curiously enough, the cerebrospinal fluid seldom showed morbid changes in these cases—a fact suggesting that there is no connection between lesions of the eye and ear and spinal meningitis.

To investigate the course of early syphilitic meningitis, Schou repeated lumbar puncture at intervals of a half to two months and found that, in fifty-three patients in the second stage, cerebrospinal fluid which originally showed morbid changes invariably showed diminution of these changes or their complete disappearance after treatment. But when it was normal to begin with, it subsequently showed morbid changes in a certain number of cases in spite of, or possibly because of, treatment. In nine cases of primary disease examined again after an interval of a half to two months, the second lumbar puncture showed that a negative finding on the first occasion is very often followed by a positive finding on the second, although in the interval specific treatment has been vigorously pushed. In other words, certain changes in the cerebrospinal fluid tend, like Wassermann's reaction in the blood, to develop in spite of treatment. At one time the effect of this tendency was labeled "neuro-recurrence," but it really is the expression of the further development of a slight attack of syphilitic meningitis. In thirty-nine cases, three "re-punctures" were made about a year after infection, and they showed that, whether the cerebrospinal fluid be "positive" or "negative" in the secondary stage, it will as a rule be "negative" after a year. But, in a few cases, it will still be markedly "positive," although, as a rule, the patient notices no effects thereof. Four "re-punctures" in twenty cases in which the disease had lasted two to five years showed the same

phenomenon; in a certain proportion of cases latent syphilitic meningitis persists.

Discussing the proposition that these cases, in which the cerebrospinal fluid is abnormal, subsequently terminate in general paralysis and other nervous diseases of syphilitic origin, Schou remarks that this can hardly happen to all, for on clinical evidence only 10 to 15 per cent of all cases of syphilis develop these late syphilitic lesions. The cases he suspects as being most liable to develop general paralysis, etc., are those in which the cerebrospinal fluid shows morbid changes directly after infection. There were 12 such cases among 500, *i.e.*, 2.5 per cent. A second class of case which would probably be peculiarly liable to general paralysis, etc., would include those in which morbid changes in the cerebrospinal fluid persisted or relapsed. There were 6 such cases out of 60, *i.e.*, 10 per cent. Adding this percentage to the 2.5 per cent already referred to, he gets a ratio of 12.5 per cent. This, he points out, tallies with the ratio suggested by clinical evidence. He admits, however, that this selection of candidates for general paralysis, etc., is based on purely hypothetical grounds, and only systematic neurological examinations of many syphilitics conducted over a considerable period can control his hypotheses. [C. L.]

III. SYMBOLIC NEUROLOGY

3. PSYCHOSES.

Hyman, A. Hypernephroma with Tuberous Brain Sclerosis and Adenoma Sebaceum. [Journ. of Urology, Vol. VIII, No. 4.]

Occasionally a combination of several diseases takes place with such regularity as to preclude the possibility of a coincidence. This applies to the association of three maladies first described about forty years ago, in which it was noted that in the condition known as tuberose brain sclerosis, there was frequently present a peculiar skin eruption known as adenoma sebaceum, and tumors of the kidney, single or multiple. Sixty cases have been reported in which kidney tumors were found in forty-five instances. Practically all cases occur within the first two decades. The brain lesion manifests itself clinically by delayed mentality or by varying degrees of imbecility and idiocy; epileptiform seizures are common. The renal growths vary considerably in size, and the following types have been found. Angio-, myo-, and lipo-sarcomata, myolipoma and hypernephroma. The etiology is obscure, the prognosis bad, the majority of patients dying within the first two decades of life.

The case observed was in a boy ten years of age, who since early childhood has had convulsions and has been mentally deficient. The skin eruption (adenoma sebaceum) has been present for years. A month before admission to Mt. Sinai Hospital (April 19, 1918) the boy com-

plained of weakness and lassitude, followed by pain in right loin. Physical examination showed a well nourished boy with a dull apathetic expression. His answers to questions showed a decided state of mental inferiority. There was a peculiar looking eruption covering the face and cheeks. A large nodular mass was palpated in the right loin. Following radiography and cystoscopy, a diagnosis was made of a right renal tumor. At operation a few days later, a large tumor of the kidney was removed, which on pathological examination, proved to be a hypernephroma. When last examined (Feb. 20, 1922), three and one-half years after operation, the boy was found to be in good physical condition with no evidences of recurrence or metastases. The mental symptoms however seem to be progressing. [Author's Abstract.]

Sachs, E. Birth Control in Families with Amaurotic Idiocy. [Zentralblatt für Gynäkologie, Vol. XLVI, No. 20, p. 789.]

Should a physician advise the parents of an amaurotic idiot to prevent further conception? This is the problem set forth; his answer is that such advice would be unjustifiable. It is the duty of the physician to warn the parents of the possibility of other defective births but also normal births may result. He shows in less than twenty families forty-four healthy brothers and sisters of the thirty-three children with the amaurotic family idiocy.

Potter, H. W. Endocrine Therapy in Mental Deficiency. [Endocrinology, VII, No. 1. J. A. M. A.]

The cases chosen by Potter for glandular treatment belonged to three endocrinopathic groups, namely, the status thymicolymphaticus, the hypothyroid, and the dyspituitary. Immediately before instituting treatment, these patients were examined for height, weight, blood pressure and blood sugar content. Their intelligence was measured by the Terman scale. Symptoms referable to glandular disturbance were observed. Desiccated thyroid and whole gland pituitary substance were given by mouth. Of fifty-two patients, fifteen showed definite improvement. This improvement consisted of an increase of from four to nineteen months as determined by the Terman scale over what could have been predicted considering their rate of progress prior to instituting glandular therapy. The aggregate net gain made by these fifteen patients amounted to 126 months, or an average of 8.4 months for each patient. Close correlation was found between the mental and physical improvement. In every case but one, an improvement in the general physical condition, blood pressure, blood sugar content, or net increase in height and weight was found. Potter warns against drawing hard and fast conclusions. In closing he says: "Let it suffice to say, for those who may be inclined to apply this report too generally, that endocrinology may at some time in the future explain the origin and offer a promise of a certain amount of improvement in only a selected small percentage of our mental defectives. Finally,

to regard endocrine therapy as a panacea for mental deficiency would curtail what legitimate use it may subserve."

Potter, H. W., and Viers, R. S. Hereditary and Non-hereditary Mental Defect. A Comparative Study. [Am. Archives of Neurology and Psychiatry, IX, No. 3, p. 339.]

Fifty patients with a history of feebleminded ancestors and 50 patients having an unimpaired heredity, were studied comparatively with respect to etiology, intelligence, physical growth and physical defects and diseases. In only one patient of the hereditary group did both the history and the physical examination offer a plausible explanation as to the etiology of the mental deficiency. In the nonhereditary group, on the other hand, the history and the physical examination combined in 15 patients to give a plausible reason for the feeblemindedness. The average intelligence quotient of the hereditary group, 56, was 15 points higher than that of the nonhereditary group, which was 51. In the former group, there were no idiots; 5 were imbeciles, 35 were morons, and 10 were borderline types. In the latter group, there were 12 idiots, 12 imbeciles, 24 morons, and only 2 belonging to the borderline type. The heights and weights of patients belonging to the hereditary group were consistently quite below the normal for the same ages, while the heights and weights of patients with a negative heredity were not appreciably below normal and in many cases exceeded those of the normal. In the hereditary group, 26 patients showed a physical defect, which was neurological in nature in three instances. In the nonhereditary group, 30 patients showed a physical defect, which was neurological in nature in eleven instances.

Torrance, H. W. Amaurotic Family Idiocy. [Glasgow Medical Journal, Vol. XV, No. 6, p. 341.]

The cases described by Torrance, being the youngest in the list, most clearly resemble the infantile Tay-Sachs group, with regard to the age incidence. Histologically, they also resemble it, but possessing the typical pathologic picture of degeneration of optic nerves, nerve fiber layer, and ganglion cells (a triple syndrome). They present fewer additional variations to the accepted triple syndrome than the other cases. Of these additional irregularities, most certainly the degeneration of rods and cones may be discounted, owing to postmortem change and method of fixation. In the elder cases (*i.e.*, Ichikawa and Wandless) the retinal destruction is most complete. This may be due to the patients having lived longer than in the infantile group, and so allowing the final stages of degeneration to take place.

Bing, R., and Schönberg, S. Transvertitism. [Schweiz. med. Woch., LII, No. 49–50.]

Bing and Schönberg publish four cases of pronounced transvertitism—insistence on dressing in the clothes of the opposite sex. One of the men used boyish clothes.

Johnson, Alice E. THE CONSTITUTIONAL PSYCHOPATHIC INFERIOR. [Am. Journal of Psychiatry, January, 1923.]

The author of this paper protests against the general use of the terms psychopathic personality and constitutional psychopathic inferior in conditions which are in fact undiagnosed, and she tries to establish a basis in functional pathology for a more exact meaning of the terms. In an effort to differentiate between some types of cases which heretofore have been placed in this vaguely outlined group a large number of patients were studied with reference to personality traits. The demand which is made upon personality is adjustability. A normal person is one who is adjustable to his environment—that is, one who continually fits into the changing social situation. What determines the degree of adjustability which an individual will show? It seems to be his specific reaction to pain. The experience of pain and the remembrance of the sensation produces *fear*. It is the capacity for *fear* in the personality which determines his reaction to society. A good working name for this quality is moral impressionability.

Social misfits are found to have for their particular environment either too much or too little moral impressionability, and it is those who have too little of this quality to whom it is claimed that the name constitutional psychopathic inferior should be applied. Those who deviate from the normal on the side of too much fear are called psychoneurotics, because in them there is the same processes of over-reaction, excessive self-protection and tendency to repression of the energy which distinguishes the well developed cases of psychoneuroses. A distinction should always be made between these two classes of personalities, because the treatment applied will have to be exactly opposite in type. The constitutional psychopathic inferior does not yield to treatment. His defect is inborn, and not the result of any reaction. Lacking in moral impressionability, he cannot be taught and cannot learn moral qualities. He does not learn by experience, does not remember the sensation of pain, his reflexes are not easily conditioned. His inhibitions are weak and evanescent, but his impulses are not relatively strong because his energy, being constantly discharged in following the pleasure of the moment, does not become exaggerated by repression or summation.

The diagnosis between the constitutional psychopathic inferior and the psychoneurotic cannot be made easily. The conduct of the two classes may be very much alike. But if we go deep enough into the cause of this conduct the difference will be apparent. This is an important subject in social psychiatry. The problem of the constitutional psychopathic inferior is an urgent one, and must be handled at last by the state. But it is the psychiatrist who must lead the way by a closer study of the patient and a more scientific knowledge of the motives of human conduct. [Author's abstract.]

Halbertsma. Mongoloid Idiocy in Twins. [Ned. Tijd. v. Gen., II, No. 1. J. A. M. A.]

Halbertsma has found records of nine cases in which one of a pair of twins presented mongoloid idiocy. He analyzes them and reports further five similar cases. The twins were of opposite sexes in all but one instance, and a bivitelline pregnancy may be assumed. In two further cases the sexes were the same, and both twins were of the mongolian idiot type. These two cases sustain the assumption of an endogenous origin, either the ovum or the spermatozoon or both being abnormal. He inclines to incriminate the ovum, as the mothers were mostly close to the extreme end of the reproductive period, and exhausted by numerous pregnancies. In his cases, the women were thirty-five, forty-one, forty-three and forty-four years old. He adds thaht he does not include in his list the case described in by McLean in *The Journal,* Jan. 7, 1922, p. 13, as he does not regard it as a case of actual mongolian idiocy.

4. MEDICO-LEGAL; SOCIAL.

MacWilliam, J. A. Pathologic Changes Produced in Those Rendered Insensible by Electric Shock and Treatment of Such Cases. [Arch. of Radiology and Electrotherapy, Vol. XXVII, No. 1, p. 11. J. A. M. A.]

By experimental investigation MacWilliam has found that there are two modes of immediate death by electric shock, and there may be a combination of the two. In the ventricular fibrillation due to electric shock, artificial respiration should be at once begun to keep open the possibility of recovery of the ventricular beat which may possibly occur, though if the period of ventricular fibrillation is more than a very brief one, the central nervous system will probably have suffered irretrievable damage from the period of circulatory arrest. The only active remedial measure that has been found useful in ventricular fibrillation so far, viz., massage of the heart through the diaphragm after the abdomen has been opened, is obviously not available under the conditions in which electric shock occurs. Heart massage, when applicable, is rendered much more effective by the intracardiac injection into left ventricle or a vein of urethane, from 0.025 to 0.25 gm.; strontium chlorid, from 0.01 to 0.06 gm.; epinephrin, from 0.1 to 1 mg.; herudin, from 8 to 10 mg.; pilocarpin (injected into vein), 0.0025 gm.

Weygandt, W. Psychology of Witnesses' Testimony. [Berlin Letter, J. A. M. A., Feb. 10, 1923.]

Weygandt, director of the Hamburg hospital for the insane, following out an idea of the psychologist, W. Stern, has had a special film prepared to illustrate the psychologic value of w tnesses' testimony. At a recent meeting of the Hamburg forensischpsychologische Gesellschaft, a report of which Rittershaus gives in the Psychiatrischneurologische

Wochenschrift, a film was shown representing a scene in a tavern; a fight develops; one of the guests draws a large pocket knife and opens it, but is thrown out of the room by the other guests before he has a chance to use it. One of the guests remaining suddenly discovers that some one has taken his hat and left another in its place. This incident has nothing to do with the scene in which a knife was drawn. When the last guest has gone, there still hangs a lone silk hat on the hat rack. It belongs to no one visible in the picture. The experiment covered about twenty questions that those who assisted in the experiment had to answer after the film had been shown. Four of the participants, who endeavored to be extremely cautious and therefore answered only a fourth of the questions asked, had nevertheless 26 per cent of the answers wrong; while sixteen participants, who answered from six to ten questions, had 43 per cent of errors. Twenty-two participants, who answered from eleven to fifteen questions, had 36 per cent of their answers wrong, and thirteen participants, who answered more than three-fourths of the questions, had 32 per cent of wrong answers. A series of questions as to what actually happened produced 53 per cent of correct answers. Those most careful with their replies and who answered only a few of the questions had 48 per cent wrong answers, whereas the keenest observers, who had answered three-fourths or more questions, gave 40 per cent wrong answers. Rittershaus discusses, among other things, also the value of children's testimony. He cites two instances in point. In one case the crucial testimony was to be given by a boy. He could not be heard as a witness, however, because, at the beginning of the hearing, he had an attack of what appeared to be hysterical convulsions. Any psychiatrist will naturally be inclined to question the credibility of this probably hysterical child. In the second case, psychopathologic factors did not play any part. It was a question as to what some children actually saw and what imagination and other factors led them to believe they saw. Rittershaus says: "The imagination of the children, stimulated by the horrors recounted in the press, and likewise doubtless by the stories they had heard their elders tell, was still further aroused by the things they had found in the gipsies' camp, and by the time they got back to town the ragged shirt, the old pasteboard box and the 'bloody knife' had metamorphosed into the mutilated body of a child."

Hellpach, W. Racial Physiognomy. [Berlin Letter, J. A. M. A., Dec. 20, 1922.]

Hellpach, instructor in psychology at the polytechnic in Karlsruhe, and now minister of public instruction in Baden, delivered an address before the Heidelberg Naturhistorischmedizinische Verein on the influence of heredity and environment on physiognomy or facial expression. As distinct from the inherited manifestations and qualities of constitution and race, which are comprised under the term "genotype," Hellpach

distinguishes a "phenotype," which is characteristic of the tribe or clan. Marks of the phenotype become stamped on the face at about the fifteenth year of age, and are dependent on the place of residence or the environment. The influence of the genotype breaks its way through and manifests itself also in children born in the new environment of parents of a different stock or even in children who were brought to a new region in their early childhood. Hellpach referred to statues of German painters (using for the Franconian face Albrecht Dürer and for the Swabian-Alemannic type, Hodler and Hans Thoma), and also to photographs to illustrate the phenotypes of the two ancient tribes that form the population of Baden. He called attention in the Franconians of the old Palatinate in northern Baden to the triangular shape of the face, the pointed chin, the long nose, the protruding cheek bones and the correspondingly marked "zygomatic shadow," giving rise, if the soft parts are well developed, to a heart shape or to an oval form with the smaller end of the oval projected downward, whereas, among the Swabian Alemannians in southern Baden, a broad chin and flat cheeks, rising perpendicularly, give the face a square-set or rectangular appearance; or, if the soft parts are more fully developed, a full-moon face, socalled, results. Hellpach thinks that the cause for a phenotype existing in a pure form for centuries lies in the peculiarities of the dialect; or, not so much in the dialect as such, as in the accentuation and the dynamics of the spoken language. The position of the accent, the type of the accent, and the mode of speaking (whether rapid or slow), occasion in the various dialects a different type of "mimokinetics" (play of the features) and a varying innervation of the organs of speech, all of which factors, in turn, serve to model the face accordingly, a more lively motion of the lips being characteristic of the more "labial" dialect of the old Palatinate, and a more set and fixed expression about the mouth being typical of the predominantly guttural Alemannic dialect. Simultaneous with the adoption of the dialect, there is an habituation to the tribal temperament or disposition going on, whereby an inborn or hereditary temperament may likewise be transformed. The effects of imitation and adaptation, which are such significant factors in human life, serve to explain the fact that the phenotype of the tribe prevails and appears even in the children of immigrants of different tribal origin. This assimilation of immigrants by the old native stock is, in Hellpach's opinion, the explanation of the riddle why, in spite of wars, revolutions and marked shiftings of the population, the ethnical boundaries of the old German tribes have remained essentially the same for a thousand years. It would appear, therefore, that tribal instincts and tribal peculiarities are not so much a physical as they are a mental product, and we find herein a confirmation of the words of the poet that it is the mind that molds the body.

LeRossignol, W. J. Death from Electric Shock from House Current. [Corresp., J. A. M. A.]

To the Editor:—I was called recently with Dr. F. W. E. Henkel of this place to see a man, aged fifty-three, height five feet ten inches, weight about one hundred and eighty pounds, who was reported to have received an electric shock. On arrival we found that he had been dead for a number of minutes, and all efforts at resuscitation failed. He had been sorting apples in an outside cellar, and the floor and his feet and clothes were wet. He clutched an electric lamp in his hands which were held tightly on his chest. No marks were found on the body. The lamp was a seventy-five Watt Type C Mazda, attached to the ceiling by a long No. 18 lamp cord. The fuses at the meter were not of more than thirty amperes. The lamp was still burning when the first man reached the spot, and was not blackened. The fuses were intact. The current is brought to the ranch at 2,300 volts, and transformed to one hundred and ten volts for lighting purposes. It is alternating, sixty cycle. The day was stormy with snow and some wind. The injured man had always been strong, and had not complained in the last few months. There was no necropsy. We wish to learn whether death from a 110 volt current is at all common, as we never before heard of a well authenicated case.

W. J. LeRossignol, M.D., Rifle, Colo.

Answer—Death from shock by a one hundred and ten volt electric current is not an uncommon accident. Indeed, it has been said that no current at a pressure of more than fifty volts is really safe. Alternating currents are more dangerous than direct currents. Accidents of this kind are prone to occur when the skin is moist and the body is in contact with a good "ground." They have been somewhat frequent when electric bulbs or sockets have been handled when the person was in the bath tub. Several reports of fatal accidents of this kind have been recently abstracted in the journal:

Balthazard, V.: Electric Accidents from House Currents, *Paris méd.* 12:361 (Oct. 21), 1922; abstr. The Journal, Dec. 30, 1922, p. 2255.

Zimmern, A.: Electric Accidents with House Currents, *Bull. de l'Acad. de méd.* 87:155 (Feb. 7), 1922; abstr. The Journal, March 25, 1922, p. 925.

Langlois, J. P.: Electric Accidents with House Currents, *Bull de l'Acad. de méd.* 87:158 (Feb. 7), 1922; abstr. The Journal, March 25, 1922, p. 925

Zimmern, A.: Electric Accidents with House Electric Current, *Presse méd.* 28:25 (Jan. 10), 1920; abstr. The Journal, Feb. 28, 1920, p. 635.

Jelliffe, S. E.: In Peterson and Haynes, Medical Jurisprudence, 2d Edit., 1923, L. W. B. Saunders and Co., Phila.

Heydrich, C.: Fatal Accident from Contact with Low Tension Wires, *Zentralbl. f. Gewerbehyg.* 8:239 (Dec.), 1920.

Mieremet, C. W. G.: Death from Shock from Incandescent Bulb, *Nederlandsch Tijdschr. v. Geneesk.* 2:1951 (Dec. 1), 1917; abstr. The Journal, March 2, 1918, p. 661.

Morrow, C. H.: Accidental Electrocution by a Weak Current, The Journal, June 13, 1914, p. 1889.

Balthazard, V. Electric Accidents from House Current. [Paris Méd., Oct. 21, 1922, XII, No. 42, J. A. M. A.]

Balthazard adds another case to the list he has compiled since 1914 in which the ordinary alternating current of one hundred and ten volts electrocuted a person accidentally shortcircuiting this comparatively weak current. The action of the electric current is scarcely felt when the

body opposes the normal resistance. It averages about 10,000 ohms, so the intensity of the current's action is only one hundred and ten volts divided by 10,000 ohms, which equals eleven milliamperes. But if the hands are wet or greased or if the feet are in water, the resistance of the body may drop to 1,000 ohms or less, and the quotient of one hundred and ten divided by 1,000 is one hundred and ten milliamperes and we know that eighty milliamperes of an alternating current will kill a dog.

Norman, H. J., et al. Genius and Insanity. [B. M. J., March 31, 1923.]

This author opened a discussion on genius and insanity. He admitted that a satisfactory definition of either term was difficult, but some relationship between the two things had been long noted. Even Aristotle observed that literary men—poets in particular—suffered from melancholia. Seneca made a similar remark. The socalled demon of Socrates was a hortatory hallucination. More dogmatic writers had stated that genius was really a neurosis. That, of course, was far too sweeping. One of the most satisfactory definitions of genius was by a man who himself was a good example of it, and who eventually committed suicide —B. R. Haydon, the historical painter of the early nineteenth century. Haydon described genius as nothing more than "our common faculties refined to a greater intensity." Huxley said that genius meant innate capacity of any kind above the average mental level, and that the genius among men was in the same position as the sport among animals and plants. To Dr. Norman it seemed that the brain organization of different individuals must be as varied as the facial expression or the muscular development. Certain types of brain must be more prehensile than the rest, have a greater potential for education, be able more readily to acquire knowledge, and have greater capacity for storage. In such brains there must be marked development of the association fibers and ready facility for canalization. In fact, their structure represented the latest development and the highest acquirement, and therefore, as Hughlings Jackson said, they were the most complex, the least organized, and the likeliest to break down. It was, of course, a fallacy to say that because a genius became insane therefore insanity was the cause of genius. That argument was disproved at once by the production of a single genius who was not insane. But it was obvious that in the genius there was instability of the nervous system, resulting in a brain of exceptional calibre for as long as the system maintained its balance, but with a tendency to topple over into insanity. When the insanity occurred, as a rule the genius came to an end. The two did not run concurrently, though they might alternate. An example of this was Nietzsche. With confusional insanity it would be quite impossible to have any collective mental effort. On the other hand, mania in a mild degree might cause the mental processes to go forward

more rapidly. This was observed quite frequently in the early stage of mania. With paranoia, even when persistent, there could be great mental power. But insanity might and often did terminate a period of mental brilliance. It was all a question of unstable equilibrium. There was one other factor involved which it was too early as yet to discuss. It was possible that these changes from mental brilliance to insanity were due to fluctuations in the discharges of one or other of the ductless glands. The fact that epilepsy might be associated with an extraordinary outburst of mental energy was possibly connected in some way with the ductless gland secretions. Dr. Norman believed that the whole question could be approached best from the biological standpoint. Little progress was to be made so long as it was made a matter of pure psychology.

Dr. W. H. B. Stoddart doubted Dr. Norman's premises. He himself had known two great geniuses whose names would be remembered to the end of time—Hughlings Jackson and Professor Freud—and both of them were extremely sane individuals. Darwin, Copernicus and Galileo were undoubted geniuses, but he had never heard their sanity impugned. Nobody doubted that the mind and the nervous system were intimately related, but the point of view of psychology was that the study of the nervous system was not sufficient to lead to a knowledge of psychology, normal or morbid; it was necessary to take, as it were, a dive off the deep end and approach psychology *per se*. Psychoanalysts had found that they were able to explain the psychoneuroses and, to some extent, the psychoses in a way that was not possible by the mere study of the morbid anatomy of the nervous system. In some of the psychoses there was no morbid anatomy; the nervous system was perfectly normal.

Dr. Bernard Hart said that it was out of the question to maintain that genius was invariably insane; yet genius and insanity did occur together in a sufficient number of cases to lead one to search for some connection. He himself favored the conception that human beings were, roughly, divisible into two types, the sensitive and the stable, the former reacting continually to outward impressions, the latter able to shut out events and pursue their own steady way. To the extra sensitive type would no doubt belong the larger proportion of the insane, and also the larger proportion of geniuses.

Book Reviews

Dwelshauvers, Georges. Les Mecanismes Subconscients. [Felix Alcan, Paris.]

This small monograph impresses us as a meticulously carried out piece of academic research on mental imagery in a small field of classroom behavior. It will interest the psychometrist but is of no particular service to the neuropsychiatrist.

Bellucci, Luigi. Localizzatione dei Centri Corticale dei Movimenti Laringei. [Stab. Tip. S. Bernardino, Siena.]

This is one of a group of excellent monographic studies which issue from time to time from the Italian clinics, this time evidence of work developed in the otolaryngological clinic in Rome and the physiological laboratory of the University of Sienna.

The monograph contains a brief but satisfying literary résumé, then details experimental evidence with dogs, follows the secondary degenerations and makes an effort to coördinate the clinical findings. The physiological experimental data establish the existence of a sensori-motor zone of the cortex of dogs in the gyrus coronalis (Ferrier) in which the facial muscles are represented, anterior to the orbicularis palpebrarum. A complete dissociation of the phonetic and respiratory functions of the larynx is demonstrable, as well as the possibility of separating cortical areas of laryngeal abduction and of adduction, and elevation of the larynx is obtainable by stimulation of a point between the orbicularis and the adduction functions. These cortical areas of stimulability are bilaterally represented. The clinical problem of laryngeal paralyses of purely cortical origin is not definitely solved as yet.

These are but a few of the many interesting situations carefully worked out by the author in this most satisfactory and praiseworthy piece of research.

Greenfield, J. G., and Carmichal, E. A. The Cerebrospinal Fluid in Clinical Diagnosis. [Macmillan and Co., Limited, New York and London.]

There have appeared many monographs large and small upon the cerebrospinal fluid, evidence of the increasing importance in clinical neuropsychiatry of a study of this important bodily substance. We consider the present volume one of the best. Not only is it readable as a bit of literature, but it is practical as a help to clinical problems in diseases of the nervous system.

The authors have had the courage to depart from more orthodox modes of presentation, following, as they acknowledge that most

excellent treatise by Mestrezat, where the clinical leads rather than the more formal laboratory technique tendencies are in evidence. This makes it of more interest and value to the neuropsychiater who himself does not carry out the techniques but would profit in his cases from the knowledge gained by them. Technique for technicians is not neglected either but is put in the concluding chapters.

From practically every point of view we find the book worthy of commendation, a very critical detailed analysis may show incomplete discussion of many minor theoretical situations, but this would require a volume four times its size and be of doubtful value after all. The authors have in the main come to characteristically simple common sense balances in most of their conclusions.

Elsberg, Charles A. Tumors of the Spinal Cord. [Paul B. Hoeber, Inc., New York. $10.00.]

This is an ideal book. It presents in great detail the author's personal experience during the past ten years with a large number of spinal cord tumors from every conceivable point of view.

It is highly instructive, beautifully presented, and is a work which no worker in neurology can afford to neglect. It is a monograph of the highest excellence and if we wrote three pages of eulogy it would only be an elaboration of detail.

Dunlap, Knight. Old and New Viewpoints in Psychology. [C. V. Mosby Company, St. Louis.]

This book consists of a pot pourri of semi-popular, semi-sarcastic and completely dogmatic lectures about a vague something called by some academic bench warmers "psychology." The reviewer found the first chapter on mental measurements a bore—in comparison with some of Boring's really intelligent discussions of the general subject of mental measurements. Other chapters read like the maundering lucubrations of a moron when put in apposition to the things supposed to be under discussion.

Still such books have to be and some publishers will publish them, but at all events workers in neurology and psychiatry will find them prototypes of that ancient allegory "they asked for bread and he gave them a stone."

Lévy-Valensi, J. Précis de Diagnostic Neurologique. [J. B. Baillière et Fils, Paris.]

The author tells us frankly this is not a manual of neurology, nor is it intended as such. It is a condensed guide for students and practitioners and as such should be thought of. Diagnostic problems such as may be primarily necessary are those which the author has constantly in mind. He cites few names, and gives no bibliography, lesions are localized by schemes rather than through details of the histopathology, pathogeny is discussed just enough to give simple comprehensible understanding of the various syndromes, the evolution of the disease pictures is dealt with only as an aid to diagnosis and the problems of prognosis are not handled at all.

The opening chapter deals with voluntary motor function, and affections of the pyramidal tract and peripheral neuron are taken up. Similarly the sensory pathway anatomy and disturbances are quickly dealt with and then follow along classical lines discussion of spinal cord, cranial nerves, and the various modes of studying the same.

In later chapters the various syndromes are dealt with in which one does not look for completeness but clarity and brevity.

This one finds to an amazing degree. We know of no book in which the illustrative schemes are as many or as helpful. They are not schemes alone, they teach truths concerning the nervous system in a brilliant, clear, and at the same time, comprehensive manner. In a word the author has very intriguingly and ingeniously created a very significant and unique volume.

Strong, Oliver S., and Elwyn, Adolph. Bailey's Text-Book of Histology. Seventh Edition. [William Wood and Company, New York.]

The particular feature which distinguishes this new edition of Bailey's Histology is the very superior section upon the nervous system by Dr. Strong. It can be said of it that it stands easily in the front rank as an exposition of the histological and anatomical details of the nervous system. To say any more would be to "paint the lily" and thus waste the valuable time of our readers.

Schwarz, O. Psychogenese und Psychotherapie körperlicher Symptome. R. Allers, J. Bauer, L. Braun, R. Heyer, Th. Hoepfner, A. Mayer, C. Pototzky, P. Schilder, O. Schwarz, J. Strandberg. Edited by Oswald Schwarz. [Julius Springer, Berlin u. Vienna. $7.]

The editor perspicaciously begins his preface of the book as follows: "The value as well as the destiny of books . . . , is determined by the degree in which they express and help realize a spiritual tendency." To those who are acquainted with the increasingly psychological tendency in diagnostic as well as therapeutic medicine, the time is quite ripe for its appearance. It fulfills at least this intention in that it is perhaps the first officially medical and conscious attempt to put a clinical foundation under the much misunderstood and maligned methods of modern psychotherapy in medicine. For the doctor, good physiology and pathology lead but to good psychological understanding.

The editor, who is Assistant Urologist to the Vienna Policlinic, finds, then, that "It is necessary, as the following pages, I hope, will convincingly show, to possess a full command of somatic medicine in order to judge the psychic components in a concrete case . . . I would conclude, then, that he only *may* be considered in these final questions of the art of healing, who has spent many a year in the laboratory but that he only *can* be considered who has gone beyond them for as long a time."

Although ten divers well known clinical specialists make up the book, and many minor differences of opinion and method lead to

contradictions, it is remarkable what a unity of purpose and comprehension welds each chapter to the central theme. The special pathology of psychogenic symptoms contains a rather difficult but, for the specialist, definitive analysis of psychic speech disturbances by Dr. Hoepfner. With all the experience of a trained internist and with the aid of manifestly far reaching culture, Prof. Braun establishes the innumerable connections between the heart and the nervous system as well as the sources of asthmatic disturbances in the personality. However he may be judged in considering the heart as the specific organ for the expression of anxiety, it is of prime clinical advantage to understand the fatal or vital symptoms such a psychic experience can set in motion. The peculiar note of personality coupled with the stamp of experience and competence are hardly better exemplified in the book than in the contingency of Prof. Braun's cultivated understanding and Dr. Heyer's experimental conviction. Dr. Heyer has extended, to include man, many of the basic principles given to physiology by Pavlow and his school.

In a day when surgery is retreating from its former misundertakings in the stomach, and Finsterer speaks of " the surgically irremediable ulcer," it is refreshing to read a systematic consideration of the sources of psychic alimentary disturbances, their possible differentiation from organic symptoms with or without psychic co-relations (the difference is a nice one but important), and the possibility and methods of psychotherapy. The practitioner will find Prof. Braun's analyses otherwise engraved in the artistic pages of Joseph Conrad's story of " Freya of the Seven Isles," who, contrary to the ostrich-like view of her father died, not of a pneumonia, but "of a broken heart." But, fly the soul where it may, its existence and activity are given in the body; and it must be to the equal edification of Dr. Heyer that Shakespeare somewhere places the seat of the soul in the liver.

Perhaps among the best written and most cogent chapters in the book are by the editor on disturbances of urination and on sexual impotence. Nor do they lack in practical value for they show only too clearly that in genito-urinary diseases of men the knife and the needle do not sum up the situation. It is this note then which is especially emphasized by Prof. Mayer in his chapter on psychogenic disturbances of the female sexual function. The fact that the heyday of surgery in gynecology is over and that the knife and the X-ray may be used only upon strict indication is aptly bulwarked by the recitation of numbers of cases from the university clinic. The special pathology includes further a chapter on psychogenic skin disturbances by Dr. Strandberg and a full review of pediatrics from this standpoint by Dr. Pototzky.

Of especial interest to American colleagues must be the successful attempt on the part of clinical men to strengthen the practice of medicine by a most thorough analysis of the philosophical and psychological principles involved. The clarification of the foundations of thought and action is the only road to rational medicine. To this end, the first section is dedicated to a theoretical analysis which is introduced by the editor with a chapter on " organismic " biology.

Here is a clear and unbigoted discussion of the essentially unhuman nature of physical science principles and the necessarily unhuman medicine which is slavishly derived from such sources. It is shown how even natural science has begun to accept principles of form ultimately derived from psychology and this psychology is that of the organism rather than of organs. The logical platform of the biology and the medicine which begins with the organism as a whole is laid down by Dr. Schilder in a chapter on the problem of the spiritual and the physical. This chapter is full of problematical discussion but it successfully and aptly divorces biology and medicine from any dependence upon the physical sciences without in the least violating their independent rights to scientific standing. The section is completed by chapters by Dr. Allers and Dr. Bauer on the psychological structure of diagnosis and treatment and on the individual constitution as a basis for nervous disfunction.

The book emphasizes throughout the place of the special psychotherapy of Freudian psychoanalysis and Adler's individual psychology. There is no intention to treat these methods in textbook fashion, but those better acquainted with psychotherapy will find in the chapters of Dr. Schwarz and Dr. Allers well organized analyses of the theoretical and practical value of these methods. The editor and Dr. Allers are both exponents of Adler's psychology but Freudians will find Dr. Schilder's pages pregnant with important extensions of their principles. SAM PARKER.

Benedek, Ladislas. THE PRESENT STATUS OF THE TREATMENT OF GENERAL PARESIS. [S. Karger, Berlin, 1925.]

Chapter I. The views hitherto held on the prospects of the treatment of paralysis progressiva have become ripe for a revision. The unity of the disease against the newer argument of Klippel does not stand in need of protection. II. The essential points of the histopathological state, on the basis of investigations by Nissl, Alzheimer, Spielmeyer and others are given in a very compendious way completing the picture with histological findings of paresis attacks and stationary forms as well as the so-called " cured " paresis cases, respectively, with the picture of the ability for histological recovery. He analyzes the histological remissions to be expected as the result of treatment, in part on ground of his special experiments. He separates the definitive changes from those capable of restoration. He is for a reserved standpoint over against the " morphological stigmas."

In chapter III the author discusses systematically the etiological factors, among them the effect of the early treatment of the lues. He gives due consideration to the experiments made by Levaditi-Marie, Plaut and Mulzer on the problem of neurosyphilis, not being silent on the recent objections. In chapter IV the connection of paresis and the spirocheta is discussed and further the immunity against lues partly on ground of the recent data relating to the special literature, partly on basis of his own experiments, receive due consideration. In chapter V on the development of paresis he takes under

consideration the different theories: the groups of high recidivism, the spirochetas, as ectoderm-parasites, the disease itself as mono-recidive (Ferrarini), the sensibilization of the brain (Noguchi), the "nonspecific" inflammation, the faintness of the cellular resistance power (Jakob), mentioning his own results obtained by experiments with the luetin reaction, the proteotoxic theory (Hauptmann), he takes sides against the admission relating to the "catalytic state" (Pötzl). He gives a detailed survey on the present status of the lues-paralysis question, especially mentioning the experiments by Uhlenhuth, Mulzer, Steiner, further those by Plaut-Mulzer, as well as those recently made by Neubürger. The "encephalitozoön cuniculi" of Levaditi requires more experiments. It would be important to inquire carefully with histological methods upon the brain, and the membranes of the brain of persons having died from lues in some intercurrent disease, to study the time of the invasion of the spirochaetas into the nervous system. VI. The author made also "intradermal reactions" with the liquors of nine paralytics, having made injections of 0.2–0.3 cm. sterile liquor on the volar surface of the front of the arm. The liquor of these persons was in all the cases of positive reaction as regards colloid, globulin, and Wassermann tests, and showed well marked lymphocytosis. The results of these experiments were as follows: In three cases, decidedly negative; in three cases there was a pale reddish-bluish colorization as large as a lentil; in two cases mediocre reaction the size of a cent encircled by a reddish field "cockade reaction," that is to say, that in the most cases of paralysis the character of the liquor reaction is not so well expressed as, *e.g.*, with other infections, chiefly tuberculous processes. VII. He expounds the immune-serous treatment of the paralysis in connection with the injection on verified paralytics in as many as sixty-three cases made at the Institute for Nervous Diseases and at that of hygiene in Kolossvár (Klausenburg-Cluj) under Professors Lechner and Rigler. The immune serum was obtained from the state stallion stables in Debrecon, received from dark animals with excellent mallein test. These stallions were given subcutaneous injections of brain emulsion of verified paralytics in every third day for two months. The specific antibodies which used to develop by reception of heterologous animal tissues did not appear. He observed the following results after the serum treatment within half a year: 9.5 per cent improved, 23.8 per cent showed progress, 30.1 per cent stayed unchanged, and 36.5 per cent died. Thus, according to the author, who publishes the concise extracts of the descriptions of the course of the disease, the benefit of the serum treatment was not to be definitely stated. He separated the cases of beginning, developed, and advanced status in order to ascertain the results of the experiment. There were noticed in a few sporadic cases the symptoms of anaphylaxia. *E.g.*, in one case, No. 26, an anxious paranoid state, it was strikingly observed that the symptoms appear after each injection. With regard to the clinical character of the disease and the relations of this to the toxin production, this case might be attributed to the credit of the protein toxin theory. In the

fifty-second case, after the second injection appeared a typical paralytic attack which passed over a paralytic status of five days' duration. This observation seems to support the toxic genesis of paralytic attacks. VIII. He gives an account of the mutual influence of the diseases, the treatments with tuberculin, vaccine, tuberculin quicksilver, natrium nucleinicum, phlogetan, milk injections, malaria, recurrens, and the results of these treatments on ground of his own experiments. He extended the personal collecting of data besides in his own institute, also in others. The following were the results of the infectious treatment according to the observations made at his own clinic until the end of September, 1924: 45 per cent considerably improved; 20 per cent improved, capable of work; 30 per cent unchanged; 5 per cent died. He mentions the atypical clinical symptoms, hallucinations, etc., chiefly in connection with the cases observed in Steinhof. IX. A separate chapter is devoted to the discussion of the changes of the serum and liquor reactions after infectious treatment from his own experiences. He dwells on the changes in the height of the composition of the liquor column, the problem of the specific "liquor spectra," the hemolysin reaction and sinking of the blood corpuscles as regards the prognostic conclusions. X. The cardinal point in the way of affect of the infectious treatment is that the filling of the organism with antigen-producing substances puts the protective institutions of the organism in active state. The functional barrier between the nervous system and the circulatory passages, which exists for ferments and antibodies, will be verosimiliter penetrant through the paraspecific treatment. The faintness of the immunity in case of paralysis needs some artificial irritants. Though the protective reaction of the organism is of omnicellular character, notwithstanding in the development of the antibodies the cells of the reticuloendothelial apparatus play in the first place a part. Besides it, the Weigert's hyperregeneratio cannot be left out of consideration. XI. He cites his own observations, which would certify that the spontaneous falling ill of malaria does not account for a paralysis prophylacticum. XII. In the chapter on syphilis and liquor he discusses the possibilities of early localization in the nervous system; furthermore, that of "self-recovery," and draws the conclusion that the old theory, according to which the so-called "metasyphilis" develops, "sneaking" from the meningeal changes of the early lues states, is to be taken as totally shaken. XIII. Although the statistical collecting of data in the problem of specific treatment of early lues and the syphilis of the nervous system cannot give definite results, nevertheless the author is of the opinion that the half of the diseased persons from "luetic early meningitis" make up the one part of those who will be taken by paralysis, and therefore the one, though not too valuable, prophylacticum of the "metalues" is the early thorough treatment of the syphilis. He gives a full review of the procedures of the antiluetic treatment, the combinations of those, the underdosing, the spirillotoxic and arsenotoxic reactions, the results of the bismuth treatment. XIV. He gives an outline of the antiluetic treatment of the quartär syphilis drawn from

his own experiences. XV. In the chapter on the intralumbal and other "direct" methods of treatment he brings out many weak points of Gennerich's "liquor-diffusion theory." In spite of this fact he gives an account of some successful achievements in the application of intrathecal procedures. At the same time he speaks of the intralumbal application of sera previously treated with salvarsan, the intracarotidal treatments and of his own modification, the liquor drainage, the results of pneumoencephal blowing in for the case of paralysis, the rôle of the permeability of the meninx, and gives everything on the liquor's communications which is known as yet in the special literature. XVI. The last chapter discusses the prophylaxis of the syphilis of the nervous system. In this place chiefly the stovarsol problem, the S. Auerbach's "skin irritating" treatment, and the chinin medication according to A. Adler are discussed in a very concise way.

To each chapter is attached a complete bibliography, and the book contains twenty-five illustrations—microphotograms, photograms indicating the remissions, colloid diagrams, etc.

Guillain, Georges. Études Neurologiques. Deuxieme Serie. [Masson et Cie, Editeurs, Paris.]

In 1922 Prof. Guillain, successor to Pierre Marie in the Salpetrière Clinic, published an extremely interesting series of neurological studies by different members of his staff. Its welcome reception has prompted him to publish this second series.

It contains contributions to Symptomatology, chiefly the mediopubic reflex, to pathology, dealing with tumors of the corpus callosum, of the corpora quadrigemina, pontocerebellar syphilis, Argyll-Robertson pupils from trauma, spinal cord trauma, amyotrophic lateral sclerosis, and hematomyelia.

A series of studies in multiple sclerosis are of signal interest; there are five of these. Studies on Secondary Degenerations, on the C.S.F., on Epidemic Encephalitis, and Varia complete this valuable collection.

Lugiato, Luigi. I. Disturbi Mentali. Patologia Speciale delle Anomalie dello Spirito. [Ulrico Hoepli, Milan.]

For some years now the well known Milan publisher Hoepli has been issuing a series of manuals upon various aspects of medical, legal, and scientific subjects. They are compact 16 mo. volumes, easy to carry, and yet are not of the nature of superficial quiz-compend volumes much affected for many years by American publishers and of late more or less imitated by French publishers. Instead, they have been concise but authoritative volumes written by experts in their respective fields.

The present volume is by Dr. Lugiato of Bergamo, director of its psychopathic hospital and docent in psychiatry in the ancient university of Padua, to whose chief, Prof. Belmondo, the volume is dedicated. It follows the usual lines of presentation first by offering short descriptive accounts of general psychopathology—percep-

tions, memory, consciousness, ideation, imagination, reasoning, judgment, instinctive activities, and disturbances of voluntary action.

He presents an elective classification which in general follows the more orthodox Kraepelian lines, and then discusses the various psychotic pictures according to this scaffolding. Criminality is discussed as a psychosis in an extremely lucid and straightforward manner. The Sexual Perversions are dealt with in the same manner.

The author's understanding of the newer movements in psychiatry is not quite up to date. He still speaks of sexual traumata as an exclusive Freudian theory and is apparently twenty years behind the times in this as well as in other aspects of psychoanalytic observations. The genetic psychology is also not present. The volume represents an excellent example of the older orthodox school from which a number of the Italian psychiaters are now turning.

Gillis, James S. False Prophets. [The Macmillan Company, New York.]

If it takes a thief to catch a thief, possibly " false prophets " are not so false as they may be made to appear. At all events, prophecy is a hazardous business and when we read this extremely superficial, at times mendaciously inaccurate caricatural flimsy of Shaw, Wells, Freud, Doyle, Nietzsche, Haeckel, Twain, France, we suspect the author of being less reliable than any of the prophets so meretriciously flayed. The appetite for propaganda whetted by the hatreds of the World War seems to be the animus of this presentation.

Bing, Robert. Kompendium der topischen Gehirn und Rückenmarksdiagnostik. Sechtse Auflage. [Urban und Schwarzenberg, Berlin u. Wien.]

This most excellent compendium appears in a sixth edition. The chief additions and alterations are chiefly confined to the illustrations. The text has been altered but slightly. New pictures are introduced, many of them in color, and new schemata are freely used, making this one of the most useful of manuals for topographical localization of cerebral and spinal cord diseases.

Lewis, Sinclair. Arrowsmith. [Harcourt, Brace & Co., New York City.]

This may hardly be called an inspired book. The author has taken the word of a malcontent, De Kruiff by name, and around it he has woven the story of a physician struggling between the reality of medicine and his ideal. Psychologically the hero of the book is a mixture, having a strong paranoid trend and a weak nature, identifying himself with the various persons with whom he comes in contact. A composite inconsistent character.

There are many truths in Arrowsmith, many partial truths, and much faulty conclusion. The description of one of the country doctors is painfully true—a man interested in medicine as a business rather than the more basic business of medicine. Lewis leads us to believe that the go getter professor who stresses office furniture to the point of forsaking medicine to enter the medical furbishing busi-

ness is a common type. He exists here and there but hardly to the degree intimated. The politician physician also is a rara avis among the run of medical men. The portrayal of the eccentric old German professor of bacteriology, Max Gottlieb, is a fine piece of work. He at least is a consistent genius with a generous streak of lunacy.

We are led to believe that Arrowsmith's maladjustments in his personal and professional life came from his conditionings due to the arrangement of his queer bedfellows. To this we can hardly agree. It would be better if his troubles were looked into from a subjective rather than an objective point of view. This we fear would scarcely be flattering to his ego. So medicine as a profession must be assailed.

Medicine or rather its present organization has many faults. Lewis no doubt could point them out brilliantly and fearlessly. History shows many critics, iconoclastic, constructive, and just critics. Shaw, Lesage, and a host of others have shouted bravely. Lewis, too, could have done a worthy job. However, the book as it stands is so warped as to lose the usefulness which it might have served. As we see it, the fault does not lie with the author so much as in his source of information. This was biased. We can see this most clearly if we follow De Kruiff in his many gyrations during the past few years.

We can see the fine Borgia-like hand of De Kruiff in the continual stressing of faulty hypotheses in preference to the actual application of the findings of medicine. We might ask, "What price theory?" when we are confronted with the task of healing and mending.

From a literary point of view "Arrowsmith" does not bear comparison to Lewis' earlier work, "Babbitt." [G. S.]

Cushing, Harvey. The Life of Sir William Osler. Two Volumes with Illustrations. Oxford Medical Publications. [London and New York: Oxford University Press, 1925. Pp. 1413.]

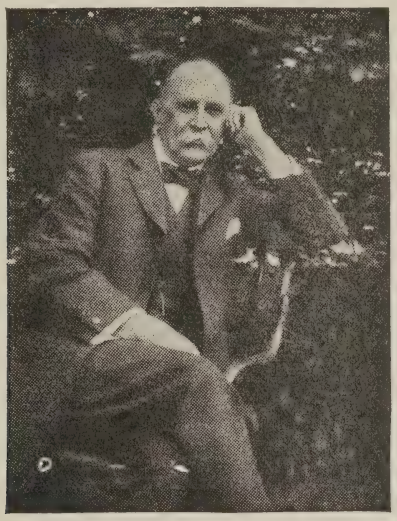
We are deeply indebted to Cushing for this splendid labor of love—the life of Osler. Here we find Osler the student, the teacher, the organizer, and Osler the man. Throughout he strikes boldly forward as though in the day's work yet filled with a rich accomplishment in every one of his many hours of endeavor. He reached far afield and brought his findings to a central focus. He worked easily, otherwise he could not have covered so much ground. He seemed to be conscious of the need of medicine of his day, and sensing this he proceeded to fill the required gap. One can see that the only reward he sought was a wider field to give out what he worked so hard to take in.

He avoided the pointing of his finger toward self. His method of taking all and giving all was an ideal one in medicine—yes, in life. He made use of everything that he came in contact with.

His studies were not confined to the clinical side of medicine alone. He dug into the work of his predecessors to find how they handled the material in their day. He saw medicine as a whole—man as a whole—life as a complex unity. He could have been an ardent philosopher we judge from the way his mind operated, but

he no doubt decided to forego sterile formula building, rather choosing the more pragmatic field of action in medicine where he could apply his genius.

How sadly medicine needs men of Osler's type. Perhaps it would be best to say that medicine has these men and the need is more to bring out the vital qualities which made him great as a clinician.



Perhaps this work will help break down some of the blocks existing in so many of us. At any rate it will serve as an inspiration to all of us and help us through so many of the apparently thankless tasks so freely found in the field of medicine.

Cushing did no haphazard work in this biography. He used every available source in his compilations and then brought them into the picture as part of the life of Osler. We are fortunate indeed to have this splendid biography while the memory of Osler and his work are still so alive in our minds. [G. STRAGNELL.]

Heyer, G. R. DAS KORPERLICH-SEELISCHE ZUSAMMENWIRKEN IN DEN LEBENSVORGÄNGEN. [Verlag v. J. F. Bergmann, München.]

This small brochure is No. 121 of the "Grenzfragen" series which contains so many stimulating monographs in small compass so characteristic of the German publishing activities.

Somatic pathology and psychopathology, and their interrelationships, make up the subject matter of this very clear and valuable study. Disturbances of breathing, circulation, general metabolism, temperature, thyroid activity, sugar metabolism, skin function, hair growth, the mouth, stomach, and the intestines—these are all discussed from the psychogenic angle. A final chapter deals with the organ neuroses.

Obituary

DR. JOSÉ INGENIEROS

Dr. José Ingenieros, noted Argentine alienist and writer, died suddenly November 1, 1925. He recently returned from a visit to Mexico. Dr. Ingenieros was a delegate to the Pan-American Scientific Congress held at Washington in 1915.

Dr. Ingenieros had urged the young intellectuals of Latin America to take the lead in a movement to displace the Pan-American Union with a Latin American Union and to raise the slogan, "Latin America for the Latin Americans." A speech of his favoring this plan was circulated throughout Mexico two years ago by the Socialist rulers of Yucatan.

JOHN HENRY WALLACE RHEIN, M.D.
1869–1925

Dr. John Henry Wallace Rhein of 1732 Pine Street, Philadelphia, died on Wednesday evening, October 14. He became acutely ill while attending a reception to Professor Pierre Janet. His death came as a distinct shock to the community and to his many friends. His professional career, so abruptly terminated, was indeed full of scientific achievement and of human service.

Dr. Rhein was born in Philadelphia in 1869. His father and brother were physicians. He studied medicine at the University of Pennsylvania and received the degree of M.D. in 1890. After serving as resident physician in the hospitals of the University of Pennsylvania and the Philadelphia General Hospital, he practiced medicine in Philadelphia until his death in 1925. In his early years he was one of the assistants to Dr. S. Weir Mitchell and the influence of that distinguished physician did much to emphasize in Dr. Rhein those qualities of enthusiasm for scientific research which one finds exemplified in his work and writings.

His associations with hospitals and institutions were numerous—chief of St. Clement's Medical Dispensary in 1894, instructor in neurology at the Polyclinic Hospital in 1893, instructor in Neuropathology 1897, assistant at the Orthopedic Hospital and Infirmary

for Nervous Diseases for thirteen years, chief of the Nervous Clinic at St. Agnes Hospital from 1897 to 1904, neurologist to St. Agnes Hospital from 1899 to 1904, physician to the Philadelphia Home for Incurables since 1898—later consultant neurologist—on the staff of the Pennsylvania Training School for Feebleminded Children 1897–1925, neurologist to the Howard Hospital until 1921. He was professor of diseases of the mind and nervous diseases at the Philadelphia Polyclinic for Graduates in Medicine—and visiting neuropsychiatrist to the Neuropsychiatric Ward of the Philadelphia General Hospital.

Besides, Dr. Rhein had an interesting career in the Navy and Army. Starting as a seaman (1893) he was commissioned lieutenant junior grade and surgeon (1894–1895) and served again in that capacity from 1896 to 1898. In the Army, he was commissioned major M. R. C. and ordered to active duty in the World War as chief of the Neuropsychiatric Service of the 90th Division at Camp Trans. September, 1918. In February, 1918, he served in the London General Hospital No. 4—then he was appointed consultant in neuropsychiatry for the A.E.F. Later he became commanding officer of Neurological Hospital No. 2 in Toul, which he organized and in September, 1918, he took over Neurological Hospital No. 1 at Benoit Baux, remaining there until he was appointed consultant in neuropsychiatry for the second army. He was dicharged from active service February, 1919, commissioned lieutenant colonel M. R. C. in April, 1920, and later colonel in 1923.

He was associated with numerous societies. He became a member of the American Neurological Association in 1908. He was also president of the Philadelphia Neurological Society, a fellow of the Philadelphia College of Physicians, the American Psychiatric Association, member of the Penn State Medical Society, Philadelphia Psychiatric Society, Pediatric Society, Pathological Society, Section on General Medicine and on Medical History, College of Physicians, American Medical Society, member of Military Order of the World War and American Legion, University Club, Gulph Mills Golf Club, Medical Club, and Physicians Motor Club.

Dr. Rhein, despite his many activities, contributed many scientific papers to our medical literature. His medical writing extended over a period of thirty-one years, during which time he wrote eighty-three articles. His contributions were either clinical, or of a clinico-pathological character. His studies on the origin of paralysis in uremia, on tremor, apraxia and his anatomic studies of the fasciculus occipito-frontalis and the tapetum and Turck's bundle were impor-

tant and valuable additions to neurology, nor were his efforts confined solely to neurology, for in addition, he contributed to the subject of psychiatry, in his studies on the war neurosis, behavior problems, juvenile delinquency, etc.

In private life, Dr. Rhein was a quiet, congenial companion. He played in the same spirit as he worked. He was devoted to his family, and was a sympathetic and cheerful companion. He truly represented a fine type of physician.

He married Elizabeth Kane of Wilmington, Del., in 1900 and had four children, two boys and two girls. Besides his widow, two sons, John H. W. Rhein, Jr., and Francis Bayard Rhein, and one daughter, Florence Bayard Rhein, survive him. Leopold (Philadelphia).

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

Vol. 63 MARCH, 1926 No. 3

The Journal

OF

Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

Original Articles

THE PROBLEMS PRESENTED BY GENERAL PARESIS

By Professor Dr. Emil Kraepelin

GERMAN RESEARCH INSTITUTE FOR PSYCHIATRY, MUNICH

Thanks to the combined efforts of numerous investigators during recent decades, our knowledge of general paresis has been extended in many directions, so that we have in great part elucidated its manifestations, its underlying cause, and the attendant morbid cerebral changes. It is beyond dispute that general paresis represents a disease *sui generis,* that is well-defined in every way and that moreover can be distinguished without difficulty from other forms of dementia caused by syphilis. The ordinary clinical symptoms are so characteristic in the great majority of cases that diagnosis can be made by an experienced alienist without more ado. The behavior of the Wassermann reaction, the time that has elapsed between syphilitic infection and the onset of the symptoms, the comparatively rapid downward course of the disease with its merciless fatal termination, the refractoriness of the disease against our common antisyphilitics, and finally, the remarkable findings in the brain at autopsy—all these are moments of import that leave little doubt as to the true nature of the disease.

In spite of the progress made in the study of the problems involved, we must admit that we are quite in the dark as to the essential nature of general paresis. The conditions governing the fateful development of the syphilitic affection into general paresis are unknown, and we are similarly ignorant of the specific reactions that attend this development.

Clinical experience has indeed in some measure illuminated the peculiarities of the morbic process involved. It was first thought that the point of purchase of the syphilitic germ is different in general paresis from that gained in cerebral lues. Attention was

drawn to the fact that in the brain there is a boundary line between ectodermal and mesodermal tissue and that it appears that this boundary cannot be crossed by a number of bodies circulating within the blood. The view was advanced that this frontier at first constitutes an obstacle to the syphilitic organism, but that as the paretic process develops, a breach is broken that exposes the brain to the invasion of the treponema. As a matter of fact, the treponemas are very often encountered in the nervous tissue and especially in the cerebral cortex of paretics; it would appear that in these cases they have not been held back by the frontier mentioned above. Unfortunately, the behavior of the organisms in lues cerebri has not been studied sufficiently, so that we are unable to deduce essential differences, although we must admit that certain anatomical findings can be interpreted in the sense of the hypothesis here advanced.

In general paresis as well as in cerebral lues, as is well known, the small cortical vessels are sheathed with lymphocytes and plasma cells, and the view suggests itself that the presence of the latter is connected with a defensive reaction of the organism against the invasion of the spirochetes from the blood into the brain-matter. From this point of view, the following observation carries some weight: These cellular sheaths are much more massive in cerebral syphilis than in general paresis, and whereas in the former affection they are intimately connected with corresponding changes of the meninges, in the latter, the morbid changes are disseminated in all parts of the cortex. This finding might be taken to indicate that the spirochetes in cerebral syphilis coming from the meninges try to enter the vessels of the cortex, whereby a very energetic resistance is met with, while in general paresis the germs circulate with the blood, leaving the vessels at numerous points without a similar resistance on the part of the organism being encountered. This hypothesis appears very enticing at first, but we must remember that we are still entirely at a loss to account for this difference in behavior. Above all, it must be borne in mind that in cases of incipient syphilis we must also assume that the spirochetes are disseminated in the whole organism by way of the circulatory system, and that without our finding cellular sheaths in the brain, or traces of the development of general paretic processes. Under all circumstances we are therefore forced to the conclusion that with the development of general paresis, the organism must become changed in some way or other so that now it is possible for the treponema to become lodged in the brain. The course of general paresis, as opposed to that of cerebral syphilis, strongly favors the assumption that the entire organism is involved, whereby we leave the question undecided whether the

systemic disorder is the result of the brain lesion or not. No one is likely to forget the picture of progressive decay presented by the vast majority of general paretics once the symptoms have become pronounced. Again and again we find that sooner or later the mental and physical powers break down completely before the end, the physical decay manifesting itself especially in a reduced resistance against all kinds of noxious agents. Concerning the precise nature of this general decay, which is so constantly observed, there is unfortunately a gap in our knowledge. Post-mortem examinations have also failed to fill up this gap, less on account of the absence of findings, but rather because detailed examinations of the physical changes in paretics as required by present-day research work, are missing. It is true that almost constantly all kinds of pathological findings can be registered in all parts of the body, but they do not appear to be characteristic, nor does there appear to be a direct connection between them and the general paretic process. Frequently such findings are due to intercurrent disorders and chance causes of death.

A different complexion is shown by an investigation of the metabolic disorders accompanying general paresis. Granted that such investigations have only just been commenced, we can state, in view of the findings hitherto recorded, that the general decay of general paretics is caused by severe metabolic aberrations. On the one hand, the patients appear to be incapable of keeping their nitrogen equilibrium; at the same time, as opposed to healthy persons, they cannot adapt themselves to altered conditions of nutrition, nor do they know how to dispose of foreign substances introduced, while on the other hand, investigations have shown increased breakdown of complex bodies in the organism; that, however, results in unfinished breakdown products being formed. If these findings should be confirmed, then we would have an explanation for the fatal decay regularly attending general paresis as opposed to other syphilitic or arteriosclerotic disorders of the brain.

A further remarkable feature of general paresis is its late development after infection has taken place. We see that syphilitic cerebral disorders can at times become manifest after a few months and at any rate their highest incidence lies within the first years after infection, while the ten or even fifteen years that elapse before general paresis develops justify our assuming that some special preparatory process is necessary here. It is true that it is very often not at all easy to determine the exact time when the disease breaks out. We have met with numerous general paretics in whom isolated symptoms were manifest many years, in some cases one or two decades, before the final onset. Such symptoms include: temporary paralysis of the

eye-muscles, fainting fits, strokes of short duration, incapacity to articulate, not infrequently a change in disposition, increased irritability, emotional lethargy and loss of memory. It is of course possible that in a certain proportion of these cases the symptoms were in reality manifestations of a syphilitic disorder of the brain preceding the onset of general paresis. Nevertheless, it cannot be disputed that in certain cases the general paretic process not only develops very gradually indeed, but that it can also commence with single prodromal symptoms. As a general rule, however, the primary stage of general paresis occupies but a few months or even weeks.

From the fact that only a comparatively small proportion of syphilitics—at the utmost 4 to 5 per cent—suffer at a later date from general paresis, we can infer that special conditions have to be fulfilled before the disease takes this fateful course. Naturally these conditions can be peculiar to the infecting germ or to the infected person; both lines of reasoning have been followed in the hope of finding the special etiology of general paresis. No confirmation has apparently been forthcoming for the view according to which general paresis is provoked by a special type of treponema that has been reputed to be distinguishable morphologically. Certain observations, however, do favor the assumption that those syphilitic disorders that induce general paresis possess certain peculiarities. Some workers have attached great significance to the observation—that is by no means very common—that several persons becoming infected at the same source, all suffered from general paresis later on. Attention has furthermore been drawn to a certain reciprocity between the frequency of skin affections, and syphilis of internal organs, especially nerve syphilis. Not only was it found that nervous disorders comparatively rarely accompanied severe syphilitic skin affections, but further, reports have been published according to which skin syphilis is very common indeed in some countries, whereas nerve syphilis is entirely or almost unknown there. Perhaps the observation of Plaut and Mulzer is of value in this regard, according to which certain races of treponema have a greater disposition to cause a rise in the cell count of the spinal fluid of the rabbit than others. The observations cited appear to indicate that in truth a special disposition on the part of certain races of the syphilis germ might account for their attacking the brain-matter. Possibly this peculiar disposition is caused by special cultural conditions.

With far greater certainty can we state that individual disposition is also a moment of very great significance in the development of general paresis. This is proved by the selection made by the disease among syphilitics, and by the common experience that the risk of

general paresis developing is by far greater in men than in women. The comparative figures can vacillate between 1 to 2 and 1 to 17 or even higher values. The contention that syphilis is much rarer in females than in males is justified, but it is improbable that this fact alone accounts for the difference in the incidence of general paresis in the two sexes. The Wassermann reaction carried out at the clinic at Munich showed that the frequency of syphilis was only slightly less in females than in males, while the former suffered from general paresis in the proportion of 1 to 2 or 3 as compared with the men. Most remarkable is the rare occurrence of general paresis in children, which is manifestly out of every proportion to the incidence of congenital syphilis.

It was Clouston in 1877 who first drew attention to the occurrence of general paresis in children and many decades passed before the number of cases reported totaled a hundred. Even if we admit that the diagnosis of the disease, as it is usually not in the hands of neurologists, leaves much to be desired in many cases, we must state that at institutes where every effort is made to detect it, only an exceedingly small number of cases comes to observation as compared with the common occurrence of congenital syphilis. The disease in children takes a much slower course, which substantiates the assumption that the youthful organism is better protected against the paretic process than the adult organism, especially of men. The objection might be raised that the peculiar manner in which congenital syphilis is communicated to children militates against the subsequent development of general paresis, but then we find that congenital syphilis in ordinary cases plays havoc with the health of its victims. Any number of observations indicate that a natural protection against general paresis, working on other lines, must exist.

An observation of the greatest significance is that the incidence of general paresis in the separate countries of the earth varies within very wide limits. In part, these variations are perhaps due to the greater or less frequency of syphilis, for example in Iceland, Scandinavia and Spain, where general paresis is a very rare disorder. Other observations that have been made cannot, however, be interpreted in this fashion. We hear from India and large parts of Africa that general paresis is unknown or very rare in occurrence, while reports have been coming from some stations in these parts that syphilis (especially of the skin) is a very common disease indeed. Doubts have repeatedly been expressed whether the reputed rarity of general paresis in some countries is not merely owing to the fact that the disease is overlooked by badly trained medical practitioners, but in my opinion, there is no foundation for such an assumption nor for

the suggestion that general paretics are kept in their homes so that their existence escapes the notice of neurologists. Of course in countries where the social care of the insane is not adequately carried out, only a fraction of psychotic patients enjoy medical attendance, but it is highly improbable that general paretics will be missing among these few, all the more so as their symptoms are usually very disturbing. If accordingly I experienced that in a hospital containing several hundred native patients not one case of general paresis could be found by excellently trained medical officers, we must infer that the disorder cannot in any way be as common in those parts as it is at home.

This observation appears less remarkable if it is borne in mind that general paresis was not always as common in Europe as it is now. Investigations in this direction have shown that indisputable cases of general paresis cannot be found in the descriptions of physicians before the end of the eighteenth century. The disease made great progress in the first decades of the nineteenth century, a progress that has continued in general until recently the incidence has remained stationary or even fallen. Unfortunately, the morbid statistics and the admittance figures of the asylums are biased by very severe sources of error, but in spite of this, there is no doubt that general paresis was by no means so common a disease in former centuries as it is now. The conclusion is justified that during the last century some changes must have taken place in the physical condition of the nations, that have weakened the protection against general paresis conferred by nature.

It appears, however, that similar changes can still take place to-day in different parts of the earth. It is a remarkable fact that reports dated forty or fifty years back mention the extreme rarity of general paresis among the North American negroes, while it appears that to-day the incidence among the black population is, comparatively speaking, equal to that among the whites. It would be of the greatest value to find out whether these statements are really correct. If they are correct, then we would have to assume the development of an increased sensitiveness of the negro population towards general paresis. In Java, where twenty years ago the disease was very rare among the native population, it also appears to have increased in frequency. It is possible that the same influence is at work that caused the swelling of the general paresis figures at the beginning of the last century, and that, as it appears, is responsible for an increased participation of females and children that were originally far less sensitive to the morbid process.

The nature of this influence that affects the health of nations, can

scarcely be conjectured. Von Krafft-Ebing some time ago invented the catchword connecting "syphilization with civilization." It is no easy matter to define what is meant by the latter term in this connection. A certain degree of enfeeblement suggests itself, which makes civilized man more prone to suffer from all kinds of injurious influences than races living under more primitive conditions, but against such an assumption we can put the observation that females and children enjoy protection against general paresis in a higher measure. Any enfeeblement ought first to be betrayed by the weaker sex, rather than by the male engaged in the struggle for life. Nervous strain and emotional excitement accompanying the hurry and bustle of our life to-day, have also been drawn into the discussion. If the histories of a large number of paretics are, however, studied, no evidence is forthcoming that these influences are of appreciable significance in the etiology of general paresis. Above all, no immediate rise in the incidence of the disease was detectable subsequent to the war, which was a tremendous strain for all nations concerned and which was attended by most violent emotional excitement. Perhaps excessive consumption of alcoholic beverages plays some rôle. The percentage of hard drinkers among the paretics treated at the Psychiatric Clinic at Munich was 40 per cent among the males and 20 per cent among the females; figures that are considerably above the average. It must be borne in mind, however, that alcohol addiction itself predisposes towards the contraction of syphilis. Further, it is perhaps more than a coincidence that those races that are in a large measure protected against general paresis, are entirely or almost entirely abstemious as regards alcohol. Very remarkable in this respect is the contrast between the Mohammedan population of Bosnia and the racially identical neighboring Catholic Croats. In the case of the former, general paresis is a rare disorder; in the latter it is common, without any appreciable differences in the respective habits being observable, apart from the difference in religion, which determines the attitude adopted towards alcohol consumption.

Perhaps a certain influence on the incidence of general paresis is exerted by infectious diseases. Pilcz and Mattauschek have demonstrated that among a large number of luetic Austrian officers, those men who suffered from an infectious disease in the first years subsequent to syphilitic infection did not suffer later from general paralysis. The fact that infectious diseases can influence the disease in its course has been known for some time, and on it is based the new form of treatment with malaria or relapsing fever. The possibility is given that protection against general paralysis is in some way proportional to the incidence of infectious diseases in a country,

and it is a striking fact that races free from paresis are regularly very much more exposed to all kinds of infections than the European is. The gradual decrease in the death rate attending the progress of medical science in civilized countries is, at least as regards adults, mainly due to the increasing efficiency attained in the combat against infectious diseases, especially smallpox and enteric fever. Maybe our prophylactics against infectious diseases cause the natural protective forces to waste owing to disuse.

Blame has also been attached to an inadequate treatment of the syphilitic infection, and some observations appear to indicate that thereby the interval between infection and the onset of paretic symptoms is shortened. Such cases—their regular occurrence still awaits confirmation—are usually interpreted in the sense that the course of treatment did not suffice to destroy all the germs, while at the same time, the stimulus to the defensive powers of the organism was suppressed. It is noteworthy, however, that in a very large number of cases of general paresis no treatment has taken place whatever; either the patients are unaware of the fact that they have been infected with syphilis, or the manifestations were too trifling to cause the man to consult a doctor. But then again isolated cases are encountered in which general paresis develops in spite of prolonged intense anti-syphilitic treatment.

We do not know to what extent personal predisposition towards general paresis plays a rôle, but so much is certain that a history of psychoses in the family carries no weight whatever. Some importance can be attached to a predisposition of the patient's parents to vascular disorders, betrayed by apoplexies and arteriosclerotic heart disease; it is possible that parental syphilis is sometimes involved. Isolated observations substantiate the view that parental syphilis favors the development of general paresis in the children, and that in cases where no congenital infection has taken place. Perhaps embryonic lesions are concerned that cause a general inferiority towards later infection.

The problems involved by a present-day study of the conditions under which general paresis develops, are very manifold in nature. It must be our immediate concern to study more in detail the biology of the spirochetes, the manner in which they invade the human body, above all the brain-matter, and finally the defensive measures called into action, especially in the case of general paresis and other syphilitic brain diseases. Such investigations are perhaps rendered especially difficult owing to the possible existence of certain other, at present unknown, metamorphoses of the microörganisms.

A second field for research work, that has practically remained untouched hitherto, is given, as mentioned, by the systemic changes

wrought by general paresis, concerning which we know next to nothing as compared with our knowledge on the histologic reactions in the brain-matter. Investigations in this direction ought to lead to the strict segregation of those disorders that are caused by the direct action of the spirochete, such as gummatous changes, or syphilitic lesions of the aorta, from other lesions due to chance causes, above all septicemia and tuberculosis. The post-mortem examination moreover in a considerable number of cases fails to reveal a tangible cause for the general paretic "marasmus," in spite of the fact that all kinds of organs—heart, liver, and kidneys—show entirely uncharacteristic changes. And yet surely some severe morbid change in the organism, concerning which regular expert examination ought to give us a clue—must be held to account for the constant fatal decay of paretics.

To-day, we have evidence that supports the assumption that the metabolism of general paretics is in the severest disorder, at least during the last stages of the disease, and it appears feasible that this metabolic insufficiency is responsible for the irreparable decay and for the failure of anti-syphilitic medication. Under these circumstances it is of the utmost importance that the metabolism of general paretics be examined again on a large scale and that continuously. Perhaps such investigations will give us an insight as to the nature and seat of the pathological disorder that causes the paretic decay. It might be thought that those regions of the brain controlling the metabolic functions are destroyed, but this assumption is not very probable, as such metabolic disorders are missing in other no less severe and extensive cerebral lesions. Nevertheless, the Argyll-Robertson pupil proves that the cerebral lesions attending general paresis are exceedingly peculiar in nature.

It is essential that current comparative statistics are prepared concerning the incidence of general paresis in different countries and among the different nations, and that by males, females and children. Such figures can be instrumental in betraying the cause of variations in incidence. It would be of the greatest value if variations in the incidence of general paralysis were followed up, and their cause if possible elucidated. A difficulty that has to be surmounted is that the figures gained are only of value if we at the same time know the incidence of syphilis itself. This moment unfortunately reduces very considerably the value of all the figures published in the past. With the aid of the Wassermann reaction we can to-day gain a reliable picture of the frequency of syphilis among a population and consequently, in principle, an inference can be drawn on the risk run by syphilitics of contracting general paresis. According to our experience, it is important that the nature of the syphilitic

manifestation is correctly registered, in particular the incidence of skin affections and of other cerebral syphilitic disorders. Such accurately compiled statistical material can possibly enable us to elucidate the conditions governing the development of the disease.

As has been previously mentioned, alcoholism and the incidence of infectious diseases ought also to be the starting points for further research work. The predisposition of the various populations to infections can be examined with the aid of vital statistics. The question can also be attacked by experimental investigations on animals that are artificially infected before, or during the various stages of syphilitic disease.

A last question that is formulated by the present position of our knowledge is whether the incidence of general paresis is in any way influenced by the nature of the anti-syphilitic treatment resorted to. Not only has the form of treatment altered very considerably within the last centuries, but it furthermore still varies extensively in different countries. In any case the treatment of syphilis is very much less efficacious in those countries that are free from general paresis than it is with us. It is no easy matter to gain reliable information respecting the nature and extent of anti-syphilitic treatment in different persons and among different nations. It is possible that the rabbit can be made to yield information on the efficacy of various methods of treatment.

The problems as they suggest themselves in the present-day study of general paralysis of the insane are naturally in no way exhausted by the brief remarks here recorded. There are surely many other points of vantage from which the complex problem concerning the essence of the disease can be attacked. It is just the multeity of the lines of research that is illustrated by the tremendous progress that has been made in the study of the subject within the last half century. As recently as 1880, the scientific study of general paresis was essentially confined to a registration of the physical and psychical manifestations and of the various courses taken by the disorder. A few years later, the morbid cortex began to be investigated and then, after a long interval, we were placed in a position to trace conclusively the syphilitic origin of the disease. Again some years elapsed before it was possible to detect the germ of syphilis in paretic brains. Each step forward has brought us in touch with new extensive possibilities of research. We have every reason to hope that the auxiliary sciences born within the last decades will assist us in our efforts to shed light on the essential conditions governing the provocation of general paresis, thereby furnishing us with a secure foundation for our therapeutic efforts.

VEGETATIVE DISTURBANCES IN POST-ENCEPHALITIC SYNDROMES AND THEIR RELATIONSHIP TO DI-ENCEPHALIC AND MESENCEPHALIC LESIONS. CHANGES IN BASAL METABOLISM.

By Sante Naccarati, M.D., Ph.D., Sc.D.

ASST. PROFESSOR OF NEUROLOGY, POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL, ADJUNCT PHYSICIAN NEUROLOGICAL INSTITUTE, NEW YORK CITY

Among the many symptomatic manifestations of epidemic encephalitis, those related to the vegetative functions have been encountered rather frequently, judging from the earliest and later reports of the different authors. Particularly the disturbances of the general nutrition, shown in cases of obesity (Abrahamson, Achard, Ascoli, Bénard, Bertolani, Beutter, Van Bogaert, Chiray and Lafaurcade, Del Valle y Jove, Farroni, Fendel, Gellatly, Grossmann, Guillain and Gardin, Lévy, Livet, Mayer, Mehrtens, Meige, Mouriquand and Déchaume, Mouzon, Nobécourt, Riddoch, Roger and Aymes, Roger and Montagnié, Rodriguez Fornos, Santangelo, Sartorelli, Stiefler, Villaret, Wimmer), of real dystrophia adiposis genitalis (Barkman, Byschowski, Büchler, Fronticelli, Légrand and Duthoit, Rivet, Rouquès and Jany, Runge, Westphal, etc.), and of lipodystrophy (Sarbò), of glycosuria, polyuria, real forms of diabetes insipidus (Bénard, Van Boekel Bessemans and Nélis, Briand and Rouquier, G. Hall, Hoke, Laporte and Rouzard, Marinesco, Moreira, Pincherle and Magni, Schüller, Signorelli, Thom, Urechia and Rusdea, Valobra, Wimmer, etc.), led some clinicians to suspect the involvement of the pituitary gland. However such belief was disproved by the histologic researches of Von Economo, Marinesco, Marie and Trétiakoff, G. Lévy, and others who demonstrated the integrity of the hypophysis, while others (Tucker, Betti, Lhermitte, Gamna, Guizzetti, etc.) merely reported acute histopathologic alterations of the gland, which could only explain the transitory symptoms of hypophyseal insufficiency found in the acute stage of the illness. On the other hand experimental and clinical researches have demonstrated long ago the existance of a center for the urinary regulation in the region of the tuber cinereum, whose lesion in epidemic encephalitis can explain the cases of diabetes insipidus without recurring to the hypothesis of a hypophyseal lesion. These experi-

mental (Camus and Roussy, Aschner, Leschke, Houssay and Hug, Bailey and Bremer, Curtis, etc.) and clinical researches (Claude and Lhermitte and others) have also proven that polyuria and other symptoms hitherto considered hypophyseal in origin, are produced by divers lesions in the floor of the third ventricle. So that to-day it is fairly well established that diabetes insipidus and the other conditions usually attributed to hypophyseal lesions may occur either if the hormonic stimulus is lacking (pituitary lesion), or if this cannot reach the centers of the diuresis because of defective canalization (lesion of the pathways connecting the gland to the diencephalic and mesencephalic centers), or if the centers are not excitable any longer on account of lesions within them (lesions of the diencephalic and mesencephalic nuclei) and also of the bulbar vegetative vagus nucleus (sympathetic vagus nucleus of Marinesco). Therefore in cases of epidemic encephalitis showing diabetes insipidus, glycosuria, and kindred disorders in the excretion through the kidney, we should not expect to find pituitary lesion, but involvement of either the nervous centers or of the nervous structures connecting them to the gland, also because the encephalitic virus seems to possess a purely neurotropic affinity.

It has been shown by the observation of the last few years that the psychic changes in post-encephalitic syndromes reflect more the dynamic traits of the personality (emotional and instinctive life) than the static traits (the higher mental functions). This is particularly true in children. In fact children in whom epidemic encephalitis caused marked personality changes, criminal tendencies, loosening of the moral sense, etc., mental tests have failed to reveal quantitative intelligence defects equal in degree to the moral and temperamental changes. The behavior of these children clearly indicates that their character and temperament have undergone more profound modifications than their intellect and that their whole instinctive life has taken a pathological course.

Winther, who has studied the mental behavior of children suffering from chronic epidemic encephalitis, is not sure whether actual defects of intellect are present in the majority of such cases. Other authors are also of the same opinion. Beverly and Sherman, for instance, after stating that "deterioration of intelligence, poor memory and poor attention are often reported by teachers and parents," goes on to say that "psychological examination, however, gives no evidence of deterioration of intelligence. . . . The childish mannerisms, impulsive nature of the delinquencies, poor insight into their mental difficulty, the appearance of deterioration,

are in marked contrast with the high rating obtained by intelligence tests." In one of our cases, a child eight years old, who showed also polydipsia, polyuria and rapid gain in weight, there were, aside from the high intelligence rating, characteristic criminal manifestations which appeared only after 6 P.M. During the morning and the early afternoon hours, the child was very good throughout and gave no cause for complaint neither to his teacher nor to his parents. Miss Bebb did not find appreciable memory losses in a group of 21 post-encephalitic patients. Her percentile, while indicating a certain degree of memory deterioration, is above the values found by Wells in group of feebleminded, senile, general paretic and manic-depressive patients. Sanguinetti also found only slight quantitative memory changes in a psychological investigation on post-encephalitic parkinsonians. He found in these patients "amimia, depression of mood, emotional and affective torpor, akynesis, aboulia" and concluded that "the psychic processes in them have become slow, exhaustible, inert, but without vesanic disturbances." Naville also reports retardation in the reactions of a similar patient to different psychological tests administered by Claparède. In a few of our parkinsonian cases to whom Dr. Garrett gave a series of performance tests (cases, Nos. 7, 9, 41, 46), we found that they did well in such tests as intelligence (S.B.) reaction time to sound, letters and digits forwards: but failed in motor and coördination tests (tapping, 3-hole, diagonal, etc.). Gozzano also in a recent psychometric research on post-encephalitic parkinsonians found increase of the personal quotient in their reaction time, but this increase was due only to the retardation of the third part of the reaction on account of the muscular rigidity.

The reason for the prevalence of the disorders of dynamic functions over the static ones lies in the fact, now well demonstrated by enormous pathological material, that the anatomo-pathological changes, found in the brains of individuals who suffered from epidemic encephalitis, are mostly located in the basal ganglia, mesencephalon and medulla oblongata.

What is the explanation for such preference of the encephalitic virus to invade the basal ganglia and the mid-brain? Is it possible that such virus possesses a special affinity for the sympathetic centers which are scattered here and there in the gray substance that surrounds the third ventricle—caudate nucleus, thalamus, hypothalamus, floor of the third ventricle (tuber cinereum, mammillary bodies)—and in that which surrounds the aqueduct of Sylvius, where, accord-

ing to Aschner, coördination centers for the whole vegetative life are located (*Stoffwechsel* and *Eigeweidezentrum*).

During the first two years of the encephalitic epidemic, we were impressed by the frequency by which basal metabolism was altered in post-encephalitic patients. This, together with the constant alteration of the emotional sphere, gave us the incentive to study the basal metabolism and certain forms of behavior by means of psychological tests. However the difficulty met with the finding a large homogeneous group (same age, sex, race, cultural standing, etc.), to whom such tests could be given, made us restrict this first report to basal metabolism alone. We hope to be able to make a report on the psychological findings at a later date.

While we were putting together the material for publication, two papers dealing with basal metabolism in epidemic encephalitis appeared. The one by Van Bogaert, who examined 12 cases of post-encephalitic syndromes, and the other by Stevenin and Ferraro, who examined 20 cases. Van Bogaert did not find appreciable changes in the metabolic rate and concluded that, if there exist any alteration of the basal metabolism at the onset of the disease, this must be dependent on a disorder of the neuro-humoral regularization rather than on a glandular deficiency. Stevenin and Ferraro found increased basal metabolic rate in 3 cases, lowering in 11 cases and normal rate in 6 cases. Those with increased rate were sympathicotonic individuals, whereas those with lowered rate were vagotonic. In another investigation on the tone of the vegetative nervous system in post-encephalitic patients, Ferraro found often hypertonus of both subdivisions of the sympathetic system. Among the cases of amphotonus, the subjects in whom the vagus prevailed over the sympathetic were more numerous.

It may be worth while mentioning here the cases of precocious puberty (macrogenitosomia precox) reported by Stern and by Wimmer, which suggest the involvement of the pineal gland or of the adjacent brain structures; and the symptom of hypothermia reported by Urechia and Elekes in a post-encephalitic patient who died from pneumonia. In this case necropsy showed profound lesions of the mesencephalic region, where the thermic regulating centers are supposed to be located. The heat regulating centers have in fact been demonstrated in animal experiment to have their seat in the corpus striatum, and especially in the tuber-infundibular and hypothalamic region (Aranson and Sacks, Richet, Bazinsky and Lehmann, Girard, Loeb, Ott, Leschke, Leschke and Citron, Bailey and Bremer, Isenschmid, Krehl and Schnitzler, Krehl and Isenschmid, Hall, Barbour, White, etc.).

Among the other symptoms referable to the derangement of the vegetative functions, we may mention hyperhidrosis, the alteration of the tonus of the smooth muscles (Meggendorfer), the pinkish coloring of the skin (Higier), bradycardia, seborrhea and the "Salbengesicht" or greasy face of the German authors, some types of ptyalism, the absence of the pilomotor reflex and Sergent's lines (Laignel-Lavastine, Coulaud), purpura (Jorge, Roger), erythemas (Bardach, Porot, Neuda, Sainton, Van Boeckel, Bessemans and Nélis), forms of zoster and facial herpes (Beutter, Souques, Netter, Lévaditi and Harvier), the disorders of the digestive apparatus, those of the sexual sphere such as frigidity (Byschowski, Sabrazès), femininism (Barkman), amenorrhea, abortion; the excessive flow of tears (Claude and Dupuy-Dutemps), exophthalmos (Schüller, Lhermitte, Kennedy, Davis and Hyslop, Grossman, Gerstmann and Schilder), enophthalmos (Combemale and Duhot), loss of hair (Wimmer), trophic alteration of the nails (Babonneix and Peignaux), oculo-pupillary syndromes (Rossi, Achard, Wimmer), vagotonic reactions (De Lisi), rapid and pronounced emaciation (Beco, Lévy, Wimmer). Several of the above mentioned syndromes and symptoms were found in the cases here reported (diabetes insipidus Case 4, polyuria and polydipsia Case 13, obesity Case 19, abortion and exophthalmos Case 19, gaining of weight Cases 20 and 26, profound loss of weight Cases 4 and 30).

Regarding the endocrine glands it is generally admitted that definite alterations and typical clinical syndromes are rarely found in epidemic encephalitis, if we leave aside the pseudo-pituitary syndromes which, as we said, are produced by involvement of nearby nervous structures having connection with the gland. The same may be said of the pineal gland syndromes (pubertas precox) although they are extremely rare and no such case has come as yet to the autopsy. Except for our case No. 32 which is reported in full elsewhere, and for case No. 36, which is now (three years after onset) developing a form frustre of Basedow, cases of typical thyroideal syndromes have not been reported. Wimmer and Santangelo mention a case each in whom there was slight enlargement of the thyroid. Other authors report rare symptoms suggesting thyroideal disturbances, such as exophthalmos and other symptoms already mentioned, but they are all symptoms which can be attributed to the sympathetic system rather than to derangement of the thyroid. Inflammatory changes were reported in various endocrine glands of encephalitic patients by some authors. Examination of the suprarenal glands by Marinesco revealed perivascular infiltration of lymphocytes and plasma cells, more especially in the medullary substance. The exter-

nal parathyroid glands were found intact by Marinesco in a case of parkinsonism. No changes were found by Luzzatto and Rietti in the epiphysis, thyroid, adrenals and pancreas of 4 patients who died from epidemic encephalitis. Regarding other glands having esocrine function, we shall mention only that marked inflammatory changes were found in the parotid glands by Marinesco, Netter, Cesare and Durand and that no changes were found in the liver by Wimmer, although Runge and Hagemann and others have reported urobilinuria and other signs of disordered liver function.

Considering however the extremely rare occurrence of endocrine syndromes in epidemic encephalitis we are authorized to connect the sympathetic-endocrine symptoms to lesions of the central sympathetic centers, as shown by the histopathological changes so often found in the diencephalic and mesencephalic areas having vegetative functions. This view is in accord with Buscaino who considers the basal ganglia and the mesencephalon a great vegeto-emotive center in as much as the expressive mechanism of the emotions depends on the integrity of these gray formations, in which he localizes the physiological center for the emotions.

Let us examine now which are the experimental and the clinical data we possess in favor of the existence of cerebral centers for the nutritional functions.

We shall leave aside the cerebellum and the cerebral hemispheres where such centers were either not found at all, or if described, their existence is still indefinite. Laignel-Lavastine in a recent paper, in giving the experimental data concerning the cortical centers for the functions of nutrition, warns against the induction based on experiments and observations for their acceptance, because "the impairment of function following a destructive lesion of a brain area cannot be constructed as a proof that in such area is located the center for that function." On the other hand we think the neopallium, being a too recent phylogenetic acquirement, cannot contain nutritional centers, at least the most important ones. These instead are to be found in the basal ganglia and in general in the gray substance that surrounds the third ventricle (optic thalamus, hypothalamus, tuber cinereum, mammillary bodies) and still below in some of the mesencephalic and rhombencephalic formations. Comparative anatomy shows in fact that the diencephalon, especially in its basal portions, belongs phylogenetically to the older portions of the brain stem. In the lowest vertebrates the diencephalon constitutes the highest center of the nervous system; its ganglia develop from the central gray matter which is present about the middle

ventricle (third ventricle in higher vertebrates), and the regio subthalamica stands in close relation to the cortex in the phylogenetic scale. It is in these gray formations then, that are to be found the numerous coördination stations for all the vegetative life, including those for the fundamental emotions, since these are coupled up with the primary instinctive reactions necessary for the preservation of the individual and of the species.

We will leave out of our discussion also the corpus striatum and the subcortical centers not because they contain no vegetative formations, but because the striate system belongs to the telencephalon, and we have to limit our discussion to the diencephalon and mesencephalon. It is well known to-day that the striate, especially the caudate nucleus, contain important vegetative centers which have been demonstrated both clinically and experimentally.

Diencephalon. In favor of the existence of vegetative centers in the diencephalon we possess many experimental proofs.

Since 1884 Loeb showed that lesion of the diencephalon caused disturbance of the heat regulating mechanism and glycosuria. Balogh and Probst obtained marked variations of the cardiac rhythm after thalamic-striate stimulations. Vasodilator and vasoconstrictor centers were found by Bechterew and Misslawsky and by Ott after thalamic stimulation. Alteration of the body temperature was observed by Peirani and Baculo, Cristiani, Tangl, Ott, Girard, Guyon, Bechterew, Aschner, Leschke, Citron and Leschke, Rogers, after lesions or stimulation of the optic thalamus; Schneider and Leschke observed arrest of protein metabolism by stimulation of the diencephalon. Leschke is a strong supporter of the hypothesis of the existence of a metabolic center in the diencephalon. He found in fact marked increase of protein metabolism after ablation of the mid-brain in animals and diminution of protein metabolism after stimulation of the base of the mid-brain. Rogers and Wheat report that removal of the cerebral hemispheres of pigeons, leaving the optic thalamus intact, does not alter the output of expired carbon dioxide in resting starving birds, nor does it alter their ability to regulate body temperature against atmospheric cold by increased heat formation and against warmth by polypnea. After removal of the thalamus the pigeon does not respond to atmospheric cold by increased heat production nor to warmth (36° C.) by painting. Marked gain in weight was observed by Probst in a cat after experimental thalamic lesions. Lewy and Dresel have demonstrated vegetative nervous centers in the diencephalon.

Nervous formations related to the vegetative life were found in

the *tuber cirnereum* and the *mammillary bodies* by Budge and Afanassiev a long time ago and more recently by Cristiani, who believed in the existence of an inspiratory center in the floor of the third ventricle and an expiratory center in the aqueduct of Sylvius. Ott obtained hyperthermy through the electric stimulation of the tuber cinereum, and found that the strongest pyretic (tetrahydronaphthylamin) failed to produce fever after extirpation of the tuber cinereum as well as of the corpus striatum.

Isenschmid found that in rabbit the mechanism of heat regulation, both chemical and physical, was disturbed after the central connections of the tuber cinereum were severed. Caselli obtained slowing of the pulse rate and increase of the blood pressure, and in one instance also glycosuria, after the section of the floor of the third ventricle, and extirpation of the hypophysis. Aschner located in the tuber cinereum a sympathetic center, whose stimulation is followed by dilation of the pupils, sweating, respiratory and circulatory symptoms, glycosuria and polyuria, trophic lesions of the sex glands. Aschner's researches and those by Karplus and Kreidl, Leschke, Bernhard, Frey, Bulké, Asher, Oshima, Houssay and Hug, Iungmann and Meyer, Carulla and Romana, Bonorino Udaondo, Mac Micken, Hanckett, Bailey and Bremer, Curtis, and especially those by Camus and Roussy have shown in a definite manner that diabetes insipidus is caused by divers lesions in the floor of the third ventricle. Clinical men, such as Lereboullet, Souques, Krehl, etc., agree with the view of Camus and Roussy, namely, that polyuria depends from lesions of the floor of the third ventricle and more specifically of the region of the tuber cinereum, which correspond to the mass of gray substance situated between the chiasm of the optic nerves forward and the mammillary body behind. The structure of this portion of the floor of the third ventricle which leans toward the ventricular cavity and which through the infundibulum extends itself to the pituitary peduncle, is, according to Spiegel and Zweig, a recent acquirement. On the other hand, Ramon y Cajal and Caselli have described a very thin nervous bundle which originates from a small nucleus situated behind the chiasm, and penetrates in the peduncle of the hypophysis.

Stimulation of the base of the mid-brain, between the optic tract and the oculomotor nerve on the sides of the infundibulum, according to Karplus and Kreidl, causes dilation of the pupils, widening of the palpebral fissures, secretion of saliva, tears and sweat, contraction of the bladder. Analogous effect were observed by Schrottenbach

and Lichtenstern. Eckhard obtained polyuria after lesion of the mammillary bodies. Jacobi and Roemer produced intense and prolonged hyperthermy by injecting carbon dioxide and mercury in the infundibulum. Alteration of the thermic regulating mechanism were reported by Schrottenbach, Leschke, Citron and Leschke after lesion of the medial portion of the hypothalamus. After such lesion Grafe did not observe the usual increase of the metabolic rate in infectious states. He found increase of the proteic exchange, whereas Leschke and Schneider found lowering of the proteic metabolism after stimulation of the mid-brain. Polyuria is considered by Oppenheim an important symptom in diseases of the subthalamic region and of the optic chiasm.

Mesencephalon. The existence of vegetative centers in the *corpora quadrigemina* (bigemina or optic lobes in lower vertebrates) is indicated by the important connections that these formations take with the large basal ganglia, with the oblongata and probably also with the spinal cord through the tecto-bulbar and the tecto-spinal tracts. Eckhard reported vasoconstriction and vasodilation after puncture of the quadrigemina. Respiratory and circulatory changes, including marked increase of the blood pressure, was observed by Danilewski after deep electrical stimulation of the quadrigemina. Slowing of the cardiac rhythm was observed by Wilson after stimulation of the optic lobes in frog. According to Openchowski the principal centers for the movements of the stomach are contained in the posterior colliculi. Hlasco thinks that there exist also a center for vomiting. In fact injections of apomorphine are not followed by vomitnig after lesion of the posterior colliculi. Budge and Valentin obtained contraction of the stomach, bladder and intestine after electrical stimulation of the corpora quadrigemina.

We have to mention here also the bulbar vegetative centers (sympathetic vagus nucleus of Marinesco) a formation of the *rhombencephalon,* situated in the floor of the fourth ventricle which the recent researches by Brugsch, Dresel and Lewy have demonstrated to be related to vegetative functions. By causing lesions to this area these authors have produced changes in the excretion through the kidney of water and sodium chloride, glycosuria and changes in the sugar content of the blood. We know that the medulla oblongata is not infrequently found to be the seat of perivascular infiltration, or degeneration in epidemic encephalitis, so it is not improbable that some of the vegetative disturbances found in epidemic encephalitis may also have a bulbar origin.

Original Investigations

The above are only a few of the many experimental and clinical observations which demonstrate how important are the masses of gray substances mentioned above as correlation centers for the vegetative functions. Our present clinical contribution on the behavior of the basal metabolism is reported as an indication of the disturbance of certain vegetative functions in individuals in whom these important centers are known to be altered. In giving the list of post-encephalitic patients who came under our observation, we have omitted the full history of each case for sake of brevity. A few data, such as mode of onset, duration, present status, etc., which may be of interest for correlative purposes, are given in a comprehensive way. We have not found any definite correlation between the basal metabolic rate and any such data as sex, age, duration of the illness, mode of onset, muscle status, facial mask, tremor, pupillary reaction, lethargia. The only positive correlation (+.74) was found between the metabolic rate and the ratio height:weight. This fact has to be expected because individuals with high metabolic rate are likely to have a high $\frac{\text{weight}}{\text{height}}$ ratio, so we interpret this correlation as an effect rather than as a cause of the disturbed metabolism.

Synopsis of the Cases of Epidemic Encephalitis
(F.= female; M.= male; H.= height in cm.; W.= weight in kg.; B.M.= basal metabolism.)

Case 1. F. A. 59; H. 159; W. 59.4. Date of first manifestation unknown. Present status: Parkinsonian syndrome. Pupils react to l. and a. B.M.+ 74.

Case 2. F. A. 33; H. 150; W. 53.7. Date of first manifestation 9 months ago. Present status: Parkinsonian syndrome without tremor. Onset gradual with headache, vomiting and somnolence. Pupils react to l. and a. B.M.+ 65.

Case 3. M. A. 35; H. 165; W. 70. Onset with somnolence and diplopia. Duration 3 months. Present status: headache and dizziness. No Parkinsonian symptoms. Pupils react to l. and a. B.M.+ 59.

Case 4. M. A. 22; H. 163; W. 61. Onset with lethargica, polyuria 2 months later. Duration 4 years. Present status: profound deterioration both physical and mental. Advanced Parkinsonian syndrome. Diabetes insipidus, drowsiness, unable to sit straight, falls forward. Pupils react to l. and a. B.M.+ 36.

Case 5. F. A. 65; H. 155; W. 57. Onset, no history of acute onset. Duration 6 years. Present status: hemiplegic Parkinsonian syndrome (left). Pupils react to l. and a. B.M.+ 36.

Case 6. M. A. 33; H. 172; W. 81.6. Onset 6 months ago with somnolence (for 4 months). Present status: Parkinsonian syndrome. Drooling. Pupils sluggish but react to l. and a. B.M.+ 33.

Case 7. F. A. 44; H. 161.5; W. 55. Onset 3 years, relapse 18 months

after no somnolence, no diplopia, no other acute symptoms. Present status: Parkinsonian syndrome, with slight tremor, marked facial mask, drooling, slowness. Pupils react to l. and a. B.M.+ 32.

Case 8. M. A. 46; H. 163; W. 69.5. Onset gradual with slight tremor in the right hand, but had had a cold with fever and nausea 6 months before. Duration one year. Present status: Parkinsonian syndrome. Pupils react to l. and a. B.M.+ 27.

Case 9. M. A. 35; H. 161; W. 58.5. Onset with somnolence for a month. Duration 3 years. Getting worse since tonsillectomy 6 months ago. Present status: Parkinsonian syndrome with tremor, marked propulsive gait. Pupils unequal and sluggish to light. B.M.+ 26.

Case 10. M. A. 24; H. 160.5; W. 53.2. Onset, headache, diplopia, ptyalism. Duration 5 years. Present status: Parkinsonian syndrome, catatonic attitude, mouth kept open. Pupils R. L. react slowly to l. B.M.+ 24.

Case 11. M. A. 33; H. 172; W. 75. Onset sudden with a bad dream followed by lethargia. Duration one year. Present status: choreic-athetosic movements of muscles of upper extremities and trunk. Pupils unequal and sluggish to l. B.M.+ 24.

Case 12. M. A. 27; H. 177.5; W. 56.7. Onset, gradual, after an attack of influenza. Duration 5 years. Present status: Parkinsonian syndrome, drowsiness, slow speech. Pupils react to l. and a. B.M.+ 24.

Case 13. M. A. 24; H. 167.5; W. 64.5. Onset, gradual, no history of acute symptoms. Duration 6 months. Present status: Parkinsonian syndrome, polyuria, polydipsia, drowsiness, drooling. Pupils react to l. and a. B.M.+ 23.

Case 14. F. A. 48; H. 152; W. 72.5. Onset, gradual, no history of acute symptoms. Duration 3 years. Present status: Parkinsonian syndrome. Pupils react to l. and a. B.M.+ 22.

Case 15. F. A. 55; H. 153; W. 58. Onset, sudden with diplopia and headache, somnolence for 4 weeks. Duration 1 year. Present status: hemi-Parkinsonian syndrome (left), drooling, loss of sense of taste. Pupils small but active to l. and a. B.M.+ 17.

Case 16. F. A. 25; H. 157; W. 45.8. Onset, sudden, with diplopia, lethargia for 2 months. Duration 5 years. Present status: Parkinsonian syndrome more pronounced on one side, poor emotional control, double Hoffmann. Pupils inactive to l. B.M.+ 17.

Case 17. M. A. 24; H. 171.5; W. 130. Onset, influenza with insomnia and uncontrollable onanism followed by gradual weakness and tremor of right arm and leg, also short period of somnolence. Present status: Parkinsonian syndrome, bilateral ptosis, paresis of right facial; catatonic attitude. Pupils react to l. and a. B.M.+ 16.

Case 18. F. A. 32; H. 1.54; W. 61. Onset, gradual, preceded by abortion. Duration 6 years. Present status: Parkinsonian syndrome, slight exophthalmos. Pupils react to l. and a. B.M.+ 16.

Case 19. F. A. 20; H. 1.56; W. 81.6. Onset, influenza, slight fever, slight somnolence for a month. Duration 4 years, relapse 2½ years later after parturition. Present status: obesity, bilateral ptosis, paralysis of both abducens, bilateral Hoffman, drooling, headache, yawning, insomnia, tremor of the hands. Pupils react to l. and a. B.M.+ 15.

Case 20. M. A. 35; H. 158.5; W. 56.3. Onset, sudden with pain in the left heel, and nocturnal delirium. Duration 3 months. Present status: pain

in left leg similar to sciatica, absent left ankle jerk; zones of anesthesia left leg. Pupils active to l. and a. B.M.+ 14. (This patient's condition was stationary for two years, then he developed, without apparent cause, a Parkinsonian syndrome with tremor, and obesity. At this time basal metabolism was found—12, pupils were found sluggish to l. Pulse and blood pressure were unchanged.)

Case 21. M. A. 30; H. 167.5; W. 82.5. Onset, sudden, with diplopia and vomiting, but no lethargia. Duration 2 years. Present status: profuse sweating, tremor of the hands, stiffness and pain in the legs, but no real Parkinsonian syndrome. Pupils unequal but react to l. and a. B.M.+ 13.

Case 22. M. A. 36; H. 160.5; W. 73.4. Onset, sudden, with fainting spell but without the usual acute symptoms of encephalitis. Duration 8 months. Present status: Parkinsonian syndrome without tremor. Pupils sluggish to l. B.M.+ 13.

Case 23. F. A. 19; H. 1.65; W. 52.7. Onset, sudden, with diplopia. Duration 1 month. Present status: hemi-Parkinsonian syndrome. Pupils react to l. and a. B.M.+ 11.

Case 24. M. A. 30; H. 1.75; W. 66.3. Onset, sudden, with dizziness, headache, amaurosis, somnolence. Duration 3½ years. Present status: Parkinsonian syndrome, drooling. Pupils unequal and sluggish to l. B.M.+ 11.

Case 25. M. A. 21; H. 163.5; W. 50.6. Onset, diplopia. Duration 4 years. Present status: Parkinsonian syndrome, drowsiness, loss of emotional control, fixed ideas, fears. Pupils react to l. and a. B.M.+ 11.

Case 26. M. A. 26; H. 165; W. 78. Onset, headache, somnolence, muscular twitching. Duration 4 years. Present status: Parkinsonian syndrome, gaining weight. Pupils large, inactive to l. and a. B.M. average normal.

Case 27. M. A. 26; H. 176; W. 65.9. Onset, headache, drowsiness, diplopia. Duration 3 years. Present status: Parkinsonian syndrome, without tremor, left side more involved, drooling. Pupils inactive to l. B.M. average normal.

Case 28. M. A. 26; H. 169; W. 76.6. Onset, diplopia, drowsiness; tiredness and diminution of sexual power later. Duration 3 years. Present status: Parkinsonian syndrome without tremor, drooling. Pupils sluggish to l. B.M. average normal.

Case 29. M. A. 41; H. 168.5; W. 68.2. Onset, insidious. Duration 8 months. Present status: Parkinsonian syndrome, right side more involved. Pupils react to l. and a. B.M. average normal.

Case 30. F. A. 26; H. 1.57; W. 48.9. Onset, gradual, no acute symptoms. Duration 1 year. Present status: tremor, depressed mood, loss of weight. Pupils react to l. and a. B.M. average normal.

Case 31. M. A. 27; H. 1.62; W. 63.4. Onset, lethargia, diplopia. Duration 4 months. Present status: Parkinsonian syndrome without tremor, drowsiness, drooling. Pupils, R. inactive; L. active to light. B.M. average normal.

Case 32. F. A. 25; H. 159; W. 47.5. Onset, sudden, with loss of consciousness, paresis of upper extremities, symptoms of severe hyperthyroidism (pseudo-Basedow syndrome). Duration 1½ years. Present status: cardiac symptoms, paresis and atrophy of the muscles of both hands, fibrillation of the same muscles, loss of knee jerks. Pupils react to l. and a. B.M. average normal. (This case was reported elsewhere as myeloencephalitis; she was seen again a month ago and made a complete recovery.)

Case 33. M. A. 18; H. 165.5; W. 58.7. Onset, headache, diplopia, somnolence. Duration 4 years. Present status: Parkinsonian syndrome, tremor more on right side, hyperextension of the muscles of the neck. Pupils react to l. and a. B.M. average normal.

Case 34. M. A. 33; H. 167.5; W. 55. Onset, sudden, with somnolence for 1 week. Duration 2 years. Present status: Parkinsonian syndrome, marked loss of emotional control, childish behavior. Pupils inactive to l. B.M. average normal.

Case 35. M. A. 15; H. 176.5; W. 55.8. Onset, sudden, with slight fever, dizziness, and exaggerated winking of the eyes. Duration 1 year. Present status: continuous movements of the tongue of choreic-athetosic type. Parkinsonian syndrome without tremor, drowsiness, paralysis of both abducens. Pupils react to l. B.M. average normal.

Case 36. F. A. 15; H. 159; W. 45.3. Onset, diplopia, spasmodic movements of the tongue, dizziness. Duration 1 year. Present status: movements of the tongue, waddling gait, suggestive Parkinsonian syndrome without tremor. Pupils react to l. and a. B.M. average normal.

Case 37. F. A. 22; H. 153; W. 55.8. Onset, pain in the left arm and nape of the neck, somnolence for two weeks. Duration 2 years. Present status: Parkinsonian syndrome. Pupils small, sluggish to l. B.M. average normal.

Case 38. M. A. 42; H. 172; W. 79.7. Onset, sudden, with paresthesia in the extremities. Duration 6 months. Present status: mild Parkinsonian syndrome, marked psychic depression. Pupils active to l. and a. B.M. average normal.

Case 39. M. A. 46; H. 164.5; W. 70.4. Onset, gradual. Duration 3 years. Present status: Parkinsonian syndrome, marked loss of emotional control. Pupils react to l. and a. B.M. average normal.

Case 40. M. A. 23; H. 165; W. 59. Onset, headache, muscular twitching, diplopia. Duration 3 months. Present status: wasting of muscles of the right shoulder, euphoria, spastic laughter. Pupils react to l. and a. B.M. average normal.

Case 41. F. A. 27; H. 154; W. 46.8. Onset, mental symptoms suggesting manic attack followed by a period of somnolence. Duration 3 years. Present status: Parkinsonian syndrome without tremor. Pupils irregular contour, active to l. B.M. average normal.

Case 42. F. A. 14; H. 1.76; W. 63. Onset, gradual, without symptoms, had a blow on the head two years previously without consequences at the time. Duration 7 months. Present status: Parkinsonian syndrome without tremor, personality changes of the dementia precox type. Pupils react to l. and a. B.M. average normal.

Case 43. M. A. 21; H. 171; W. 51. Onset, sudden, with diplopia, headache, vomiting; somnolence for about 9 months; after getting entirely well, had relapse with same symptom. Duration 2 years. Present status: Parkinsonian syndrome. Pupils unequal, R. sluggish to l. B.M. average normal.

Case 44. M. A. 48; H. 163; W. 77. Onset, sudden, acute manic state, followed by somnolence and twitching of the muscles of the right side. Duration 1 year. Present status: insomnia, nausea, general asthenia, inversion of sleep, personality changes. Pupils react to l. and a. B.M. average normal.

Case 45. M. A. 43; H. 155.5; W. 71.3. Onset, lethargia for 3 weeks.

Duration 3 years. Present status: Parkinsonian syndrome without tremor. Pupils small, inactive to l. B.M.—15.

Case 46. F. A. 13; H. 154.5; W. 47.5. Onset, somnolence. Duration 1 year. Present status: Parkinsonian syndrome, drooling, spasm of the respiratory muscles, personality changes. Pupils normal to l. and a. B.M.—15.

Case 47. M. A. 19; H. 1.71; W. 61.5. Onset, influenza. Duration 2 years. Present status: generalized muscle spasms, recalling torsion spasm, which cease when patient is lying down. Pupils react to l. and a. B.M.—15.

Summary and Comment

Our study was made on 47 cases presenting post-encephalitic syndromes of different duration and intensity. They were picked up at random regardless of age, sex and symptomatology. Basal metabolism rates between +10 and —10 by the gasometer method were considered normal. Out of 47 cases, 28 (60 per cent) showed alteration of the basal metabolism. Of these 25 (53 per cent) showed an increased metabolic rate, while 3 cases only had a metabolic rate below the normal average. The remainder 19 cases showed a metabolic rate within +10 and —10.

Judging from our findings it may be assumed that basal metabolism is altered in post-encephalitic syndromes, and considering the seat of the destructive lesions which take place in encephalitis, we can connect the alteration of the metabolic rate with changes occurring in the vegetative centers located in the gray substance which surrounds the third ventricle and the aqueduct of Sylvius. Metabolic functions are located in very complicated organs, pathways and centers, which form a chain going from the internal organs, endocrine glands, through the sympathetic nervous system to the vegetative centers of the mesencephalon and basal ganglia. A lesion in any of the structures along this chain will lead to alteration of the metabolic activities.

In an attempt to explain why in the majority of the cases we had increased metabolic rate and only in a few there was lowering, we suggest the hypothesis that the alterations above the normal average metabolic rate are the expression of anatomic lesions of centers exercising controlling catabolic action over the nutritional functions there located. The antagonism existing between the two sets of centers exercising opposite physiologic functions, sympathetic and parasympathetic, may also explain the metabolic behavior (above or below the average) since destructive lesions may occur either in the accelerator centers or in the moderator ones.

The different vegetative functions, while located in the gray formations of the diencephalon and mesencephalon, must possess

individual centers independent the one from another but closely related the one to another. Several of them must contribute to a given function, which in order to be completely abolished requires the destruction of all the portions contributing to it. In this way we can explain the polymorphism of the vegetative disorders in epidemic encephalitis, why some functions may be either temporarily impaired, or only in part or permanently impaired, the amount of function disturbed or abolished being dependent upon the quantity of nervous substance involved.

In the diencephalic and mesencephalic lesions we must expect for the vegetative functions, what we find in the cerebral hemispheres for the psychic functions, namely we cannot be extreme localizers, otherwise we will fall in the same errors in which have fallen the followers of the localization theories in the hemispheres. Vegetative functions are to the mid-brain what the psychic functions are to the cerebral hemispheres, and the more important they are the more they are dependent on the interaction of other functions, which are anatomically located in other centers. In this way we can explain why some of them are usually partially and temporarily involved, and why some vegetative disorders occur so rarely when considering the frequency by which other disorders are met with. The more important vegetative functions, in order to be totally and permanently abolished, would require the loss of such amount of nervous substance as to impair the vitality of the organism as a whole. Sometime we have to deal with mechanical obstruction (such as for instance in the case of pressure exerted on the pathways between the pituitary and the infundibular centers) from increased inflammatory exudate, giving rise to transient polyuria, if we don't want to connect it with the transient histologic alteration of the hypophysis. Such polyuria recedes as soon as the exudate is absorbed; and this is the most fortunate event for the patient. Other times phlogistic elements may infiltrate these pathways in such a way that, while leaving them anatomically intact, cause a temporary alteration of their vitality, thus interrupting the vegetative functions of the centers they are connected with, for a longer period of time, since the absorption of these elements usually takes a rather slow course. In this way may be explained the recovery of some cases of diabetes insipidus and obesity reported by some authors.

In the majority of the cases we have a permanent organic alteration of these pathways or their relative centers, leading to the permanent and progressive syndromes we know of. Isolated or combined permanent symptoms, such as obesity, polyuria, glycosuria,

hypothermia suggest the specificity of some areas where the nervous element evolved to each of these functions convene, thus constituting trophic, secretory thermic, centers, etc. The frequency by which somnolence is encountered in cases of epidemic encephalitis presenting vegetative disorders, indicates that the sleep function is connected with many vegetative functions, but it is too complex to be localized in a single cerebral center, as some authors have attempted to do.

570 Park Avenue.

AUTHORS AND WORKS QUOTED, ALPHABETICALLY ARRANGED
(Quotations on Epidemic Encephalitis only.)

Abrahamson, I. Presentation of clinical material. Epidemic polio-encephalitis. New York Neurological Society, May 6, 1919. Jour. Nerv. & Ment. Dis., 50, 4, Oct. 1919, p. 338.

Achard, C. L'encéphalite léthargique. Paris, 1921. Encéphallite léthargique. Reprises et manifestations tardives. Progrès médical, July 31, 1923.

Ascoli, V. Sulla cosidetta encefalite letargica. Riforma Medica, 35; 42–43–44; 1919, p. 945.

Babonneix, L., and Peignaux. Syndrome pallidal post-encéphalitique. Revue Neurol., 30, 1, 1923, p. 402.

Bardach, M. Ueber Enzephalitis Lethargica bei Kinderen. Monatschr. f. Kinderh., 22, 3, 1921–22, p. 475.

Barkman, A. Beitrag zur Kenntniss der Storungen der Hypophysen Function nach der Epidemischer Encephalitis. Acta Med. Scand., 56, 2, March, 1922, p. 188.

Bebb, T. L. A Study of Memory Deterioration in Encephalitis Lethargica. Jour. Nerv. & Ment. Dis., 61, 4, April, 1925.

Beco, L. L'encéphalite Léthargique épidemique. Liège Méd., 8–1–1921, 22–1–1921.

Bénard, R. Encéphalitis léthargique et palyurie extrème; polyurie hypophysaire et polyurie pithiatique. Bull. et Mém. Soc. Méd. d. Hôp., March 31, 1922, p. 553.

Bertolani, A. Sindrome adiposo-ipofisaria consecutiva ad encefalite epidemica. Rivista sperimentale di freniatria, 45, 1921, p. 467. Rivista di Patologia nervosa e mentale, 27, 1–4, Jan., April, 1922, p. 72.

Betti, A. Sulla encefalite letargica. Boll. della Clin. Milano, July, 1920, 37, p. 129.

Beutter, C. Coëxistence d'encéphalite myoclonique et de Zona. Soc. Sc. Méd. St. Etienne, April 21, 1920; Loire Méd., 1920, p. 232.

Beutter, C. Obésité et troubles moteurs consecutifs à une meningo-encéphalite chez un enfant. Loire Méd., 36, 1922, p. 477.

Beverly, B. I, and Sherman, M. Post-encephalitic Behavior Disturbance Without Physical Signs. Am. Jour. Dis. of Children, 27, 6, June, 1924, p. 565.

Van Bogaert, L. Le metabolisme basal dans les syndromes post-encéphalitiques. Annales de Médic., 15, 5, May, 1924, p. 403.

Van Boeckel, L., Bessemans, A. J., Nélis, C. L'encéphalite léthargique, Bruxelles, 1923.

Briand, M., et Rouquier, A. Encéphalite epidémique grave, compliqués de diabète insipide. Bull. et mém. Soc. méd. di Hôp., June 4, 1920, p. 769.

Byschowski. Ueber den Verlauf und die Prognose der Encephalitis lethargica. Neurolog. Zentralblatt, Erganzungsband, 1921.

Chiray et Lafourcade. Encéphalite epidémique à sequelles combinées, respiratoires, bradytrophiques et psyquiques. Bull. et Mém. Soc. Méd. d. Hôp. d. Paris, 35, 47, March 19, 1923.

Claude, H., and Dupuy-Dutemps. Forme céphalique du syndrome de Parkynson. Revue Neuol., 37, June, 1921.

Combemale et Duhot, E. Apparition de l'encéphalite léthargique epidémique à Lille. Bull. de L'Acad. de Médec., 83, 3s, 1920.
Del Valle y Jove, R. Un caso de encefalite gripal. Revista di Med. y Cirur. praticas, 44, 127, 1597, April 7, 1920.
Economo, V. Verhal. d. Deutsch. Gesellsch. inn. Mediz. Wien, 1923.
Farroni, B. Su di un caso di adiposi post-encefalitica. Boll. d. Soc. eustach. Camerino, 20, 5, 1922, p. 1-15.
Fendel. Hypopituitarismus nach Gehirngrippe. Deutsch. med. Woch, 47, 2, August 25, 1921, p. 991.
Ferraro, A. Il tono del sistema nervoso vegetativo nei cosidetti postumi dell' encefalite epidemica esplorato a mezzo delle prove farmacologiche. Arch. di Patol. e Clin. Med., 3, 4, Sept., 1924.
Fronticelli, E. Distrofia adiposo-genitale, post-encefalitica. Rassegna di clin. terap., etc., Roma, 15, 1923, p. 127.
Gamna, C. Ricerche sull' istogenesi e sulla topografia delle lesioni sull' encefalite epidemica. Giorn di Clinica Med. d. Parma, 2, 8, 1921, p. 41.
Gellatly. Quoted by Hall, A. J.
Gerstmann, T. J. Schilder, P. Studien über Bewegungstorungen. Zeitschr. f. d. ges. Neurol. u. Psych., 60, 1921.
Gozzano, M. Ricerche psicometriche sopra alcuni parkinsoniani post-encefalitici. Rivista di Patol. nerv. e ment., 30, 4, 1925.
Grossmann, M. Sequels of Acute Epidemic Encephalitis, etc. Arch. Neur. and Psych., 5, 1921, p. 560.
Guillain, G., et Gardin, C. Syndrome parkinsonien hypertonique et catatonique avec glycosurie consécutif a une encéphalite léthargique. Bull. et Mém. Soc. méd. d. Hôp. d. Paris, 45, 3, 1921, p. 676.
Guizzetti, P. Per l'anatomia patologica dell'encefalite letargica. Riforma. med., 36, Sept. 4, 1920, p. 806.
Hall, A. J. Epidemic Encephalitis, Bristol, 1924.
Hall, G. W. Diabetes Insipidus: A Case Report Following Epidemic Encephalitis with Enormous Polyuria. Am. Jour. Med. Sciences, 165, 1923, p. 551.
Higier, H. Beitrag zur Kenntnis der selteneren Symptome und Verlaufarten der epidemischen Encephalitis Lethargica. Deutsch. Zeit. f. Nervenheilk., 75, 1922, p. 250.
Hoke, E. Auftreten von polyurie (Diabetes insipidus?) im Verlaufe eines Falles von Enc. epid. Wien Klin. Woch, 26, June 25, 1920, p. 562; Zentralbl. f. Neur. u. Psych., 28, 3.
Jorge, R. L'encéphalite léthargique et la grossesse. Paris Medical, 11, 1, June 4, 1921, p. 454.
Kennedy, R. F., Davis, J. K., and Hyslop, G. H. An Additional Contribution to the Symptomatology of Epidemic Encephalitis. Arch. Neur. & Psych., July 8, 1922.
Laignel-Lavastine. Syndrome neuro-végétatif et parkinsonien chez un encéphalitique léthargique. Revue Neurol., 37, 1921, p. 641.
Laignel-Lavastine et Coulaud. Forme neuro-végétative de l'encéphalite épidémique (Presentation du malade). Bull. et Mém. Soc. Méd. d. Hôp. d. Paris, 45, 3, 1921, p. 1192.
Laporte et Rouzard. Forme myoclonique généralisée de l'encéphalite épidémique. Revue Neurol., 4, 1921, p. 420.
Legrand et Duthoit. Sequelles d'Encéphalite. Réunion médico-chirurgicale des Hopitaux de Lille. Séance, Dec. 18, 1922.
Lévaditi, C., and Harvier, P. Étude expérimentale de l'encéphalite dite lethargique. Annales de l'Institute Pasteur, 34, Dec. 1920, p. 471.
Lévy, G. Contribution a l'étude des manifestations tardives de l'encéphalite épidémique. Paris, Vigot Frères, 1922.
Lhermitte, J. L'encéphalite épidémique. Gazette des Hôpitaux, 96, Jan. 3–8, 1921, p. 37.
Lhermitte, J. L'encéphalite léthargique; anatomie et physiologie pathologiques; pathologie expérimentale; micro-biologie. Arch. d'Ophth., 39, 1921, p. 11.
Livet, L. L'obésité consécutive a l'encéphalite épidémique. Bull. et mém. Société médicale des Hôpitaux, 15, May 6, 1921, p. 656; Presse Méd., 38, 1921.

Luzzatto, A. M., Rietti, F. Contributo all'anatomia patologica dell'encefalite letargica. Lo sperimentale, 75, 1921, p. 63.
Marañon, G. Sur l'encéphalite léthargique en Espagne. Revue de Médecine, 37, 6, 1920, p. 364.
Marie, P., et Trétiakoff, C. Etat de L'hypophyse dans l'encéphalite léthargique. Bull. et Mém. Soc. Méd. d. Hôp. d. Paris, 44, 3, 1920, p. 357.
Marinesco, G. Contribution a l'étude de l'histologique pathologique de l'encéphalite léthargique. Bull. et Mém. Soc. Méd. Hôp. d. Paris.
Marinesco, G. 1918 (May 24), p. 475. Contribution à l'étude des formes cliniques de l'encéphalite épidémique. Revue Neurol., 1, 1921.
Marinesco, G., and McIntosh, T. Contribution to the Pathological Histology of Encephalitis Lethargica. Rep. to the local Govern. Board on Pub. Health and Med. Pub. No. 121, London, 1918, p. 48.
Mayer, W. Beitrag zu den Folgezustanden der epidemischen Enzephalitis. Münch. med. Woch., 68, 1921, p. 552.
Meggendorfer, F. Ueber Encephalitis Lethargica, Schlaf und Scopolaminwirkung. Deutsch Zeits. f. Nervenheilk., 68–69, 1921, p. 159.
Meige. Deux séquelles encéphalitiques juxtaposées chez un même sujet. Société de Neur. Dic., 2, 1920.
Mehrtens, H. G. Case Presented at the San Francisco Neurol. Society, Nov. 4, 1921. Arch. of Neurol. and Psychiatry, 7, 2, 1922.
Moreira, M. Polydipsia in Enceph. epid. Lisboa Médica, 1, Sept., 1924.
Mouriquand et Dechaume. Obésité post-encéphalitique chez un enfant boulimique. Lyon Méd., 132, 1923, p. 597.
Mouzon, J. Les syndromes du groupe infundibulo-hypophysaire dans l'encéphalite épidémique. Presse Méd. Paris, 31, 10, 1923.
Naccarati, S. Un caso di encefalite epidemica presentante una insolita sindrome neuro-endocrina. In press.
Naville, F. Études sur les complications et les sequelles mentales de l'encéphalite épidémique. La Bradyphrénie. Encéphale, 1922, 17, June 6, p. 369; 7 (July–August), p. 423.
Netter, A. Herpés dans l'encéphalite léthargique. Bull. et Mém. Soc. Méd. Hôp. d. Paris, 45, 2, 1921, July 15, p. 1135.
Netter, A. Éruptions Zostériennes dans l'encéphalite léthargique. Ibidem, 4G, 2, 1922, July 6, 23, p. 1028.
Netter, Cesari and Durand, H. Altérations des glandes salivaires dans l'encéphalite léthargique. Bull. et Mém. Soc. Méd. Hôp. d. Paris, 41, 1921, p. 721.
Neuda. Demonstration des "weiszen (anämischen) Exanthems" im Rekonvalezenz stadium einer geheilten Grippe-enzephalitis. Wien. Kl. Woch., May 20, 1920, p. 458.
Nobécourt. L'obésité dans l'encéphalite épidémique. Bull. et Mém. Société médicale des Hôpitaux d. Paris, 45, 3, May, 1921, p. 729.
Pincherle, M., and Magni, L. Note cliniche anatomiche e di patogenesi sul diabete insipido giovanile. Arch. di Patol. e Clin. Med., 3, 3, June, 1924.
Potet. Syndrome parkinsonien et syndrome adiposo-génital associés, post-méningo-encéphalomyélitiques. Revue Neurol., 29, 1922, p. 1024.
Porot. Troubles vaso-moteurs dans les syndromes parkinsoniens. Revue Neurol., 37, 1921, p. 638.
Riddoch. Quoted by Hall, A. J.
Rivet, L., Rouquès, L., Jany, C. Syndrome adiposo-génital lié a une encéphalite léthargique. Bull. et Mèm. Soc. Méd. d. Hôp. Paris, 41, 3, March 4, 1920.
Rodriguez, Fornos. Conferencia en el Instituto de Ciencias Medicas de Valencia. March, 1920
Roger, H. Encéphalite myoclonique avec purpura localisé et à début ambulatoire, contractée à Salonique. Bull. et Mém. Soc. Méd. d. Hôp. d. Paris, 44, 37, March 26, 1920, p. 482.
Roger, H., Aymes, G. Obésité transitoire dans quatre cas d'encéphalomyélite épidémique avec syndrome parkinsonien (glycosurie tardive dans un cas). Bull. et Mém. Soc. Méd. des Hôpitaux, 45, 3, August 4, 1921, p. 1278; Presse Méd., 62, 1921.

Roger, H., et Montagnié, L. Obésité encéphalitique énorme et transitoire au cours d'un syndrome parkinsonien consécutif à un épisode aigu ambulatoire. Presse Médic., April 26, 1922, p. 362; Marseille Méd., 59, 10, 1922, p. 496.
Rossi, O. Note cliniche sull'encefalite epidemica con speciale riguardo ai sintomi del periodo tardivo. Rivista d. Patol. Nerv. e Ment., 27, 1–4, 1922.
Runge, W. Encephalitis epidemica. Zeit. f. d. ges. Neur. u. Psychiatrie. Ref., 1, 22, 3–4, 1920, p. 205; Deutscher Ver. f. Psychiatrie, Hamburg, May, 1920.
Runge, W. Ueber Spätencephalitis. Ver. Norddtsch. Psych. u. ges. d. Neurol. u. Psych., Gross-Hamburgs, Hamburg-Friedrichsberg, Setzg., v. 9, 6, 1923.
Sabrazès, J. Frigidité et impotence sexuelles dans l'encéphalite epidémique chronique. Gaz. Hébd. d. sc. méd. de Bordeaux, 44, 1, 23, p. 206.
Sainton, P. Myoclonies provoquées et manifestations cutanées dans l'encéphalite léthargique. Bull. et Mém. Soc. Méd. d. Hôp. de Paris, 45, 12, April 30, 1921, p. 408.
Santangelo, G. L'Obesità post-encefalitica. Contributo clinico alla questione dei rapporti della ipofisi con il cervello intermedio. Il Cervello, 2, 3, May–June, 1923, p. 676.
Von Sarbò, A. Ueber Encephalitis epidemica auf Grund der Erfahrungen der 1920er Epidemie. Deuts. Zeits. f. Nervenheilk., 74, 1922.
Sartorelli, E. Sopra un caso di adiposi post-encefalitica. Il Policlinico, sez. prat., 30, May 20, 1923.
Schüller, A. Ueber ein eigenartiges Syndrom von Dyspituitarismus. Wien. mediz. Woch., 71, 11, March 12, 1921, p. 510.
Signorelli, E. Diabete insipido fra gli esiti dell'encefalite epidemica. Lo Sperimentale, 76, 1922, p. 103; Arch. di Pat. e Clin. med., 2, 1, March, 1923, p. 89.
Souques, A. Zona double à la suite d'une encéphalite léthargique. Zona ou éruption Zostériforme? Revue Neurologique, 27, p. 1208; Soc. Neurol., Dec. 2, 1920.
Stern, F. Ueber Pubertas praecox bei epidemischer Enzephalitis. Mediz. Klinik., 18, July 2, 1922, p. 864.
Stevenin, G., and Ferraro, A. Il metabolismo basale nei cosidetti postumi della encefalite epidemica. Riforma medica, 40, 3, Jan., 1924.
Stiefler, G. Ueber hypophysäre Fettsucht als Restzustand eines Falles von Enzephalitis lethargica. Monat. f. Psych. u. Neur., 50, 1921, p. 123.
Thom, D. A. Encephalitis with Symptoms Indicating Disturbance in the Region of the Pituitary. Jour. Nerv. & Ment. Dis., 54, 1921, p. 326.
Tucker, B. R. Epidemic Encephalitis Lethargica or Epidemic Somnolence or Epidemic Cerebritis with Report of Cases and Two Necropsies. Jour. Am. Med. Asso., 72, May 17, 1919, p. 1488.
Urechia, C. I., and Elekes, N. Quelques considérations sur un cas d'encéphalite léthargique. Arch. d. Neur. Psichiat. e Psichan., 4–5, Sept., 1924.
Urechia, C. I., and Rusdea, N. Diabète insipide et troubles du charactère dans un cas d'encéphalite épidémique. Bull. et Mém. Soc. Méd. d. Hôp. de Paris, 44, 3, 1922, p. 1492.
Valobra, N. Dell'Encefalite letargica. Giornale della R. Acc. di Med. di Torino, 1–2, 1920.
Villaret, M. Sur un cas d'obésité et de polyurie post-encéphalitique (obésité avec polyurie). Jour. de Méd. de Paris, 31, Jan. 19, 1924.
Westphal, A. Psychiatr. Ver. der Rheinprovinz., Bonn, 19 Nov., 1921.
Wimmer, A. Chronic Epidemic Encephalitis. London, 1924.
Winther. Quoted by Wimmer.

A STUDY OF THE PSYCHOGENESIS OF CONFIRMED STAMMERERS [1]

By L. Pierce Clark, M.D.

NEW YORK

I shall give a hypothetical exposition which deals with the large and unfortunate class of confirmed stammerers.

As is well known, chronic stammerers are rarely if ever entirely cured of their speech defects. All sorts of physical and mental training fail. Why is this so? Many explanations are given, but they are singularly unconvincing. The hereditary factor is important but uncertain and confusing in its general application to all cases. The specific fact that all confirmed stammerers rarely if ever exhibit their speech deficiency at the beginning of acquiring speech but usually in later childhood, from the age of four or five years to puberty or even beyond, makes the assumed precipitants appear as legion, including physical and mental trauma which are not necessarily dissimilar to those advanced for the psychoneuroses, and hysteria in particular. In the case of the latter assumption, the disqualification of such alleged causes from specific etiologic moment has already passed. The issues are now based upon quite other factors more dynamic in the complete development and evaluation of the whole personality.

The natural history or topography of the psychopathic constitution has only just emerged from static and preformistic concepts. Though these concepts may not yet be safely discarded from factors of great etiologic moment, the structural significance of bodily or even neural elements passing from the structural concepts of the older type to those that structure is but the product of subsumed patterns of behavior, leaves much to science and conjecture in the matter of causation. Nothing less than a union of biologic, hereditary and individualistic factors can make clear the puzzling etiology of the psychoneuroses of which stammering must be considered an integral part.

The intellectual, emotional and neural picture of individual stammerers is still to be written. Probably no single outline of personality

[1] New York Neurological Society, 1925.

will be found for this type, or will be so well defined clinically as has been tentatively outlined for the manic-depressive, the precox and the epileptic. The confirmed stammerer ranges all the way from the crassest form of psychopath to the genius or at least persons of great social worth. If the fundamental factors of personality and constitutional makeup vary so greatly, the heredity factor must lose much in pathologic significance, at least as regards specific trends which have to do directly with the defect of stammering per se. The great fault, then, must lie within the early formative experience of the individual stammerer. By and large the majority of stammerers show their defect of emotional expression so soon as they begin to talk in any large social sense—that is to say, so soon as they step out of the environment of the home and mingle with others on the playground, or in school. No amount of rationalization of the provocative cause gives us any clue to the multitudinous types of speech organ cramps which are encountered almost at the very outset of the stammerer's career. Within a few weeks a deficiency of almost all the functions of the oral organs is present, and each in its own way shows its disablement in the general speech disorder. It would seem that the associated functions of all these parts are affected simultaneously in oral expression. In other words, there is an involvement of the behavior mechanism of the whole individual. The speech process, as it were, trips over a previously laid down behavior pattern seemingly arranged for quite other purposes. What early behaviors engross the infant which combine the oral organs, and the pharyngeal and respiratory functions? None other than the simplest and earliest functions of nursing. It is rather astonishing that this simple explanation has not been noticed by all of us long ago. One has but to observe any stammerer and the unfortunate use to which he puts these organs in speaking to detect all the blurred functions of the acts of nursing in operation.

We have already shown that habit movements and tics are also similarly disordered mechanisms of behavior which have passed from earlier physiologic use but still persist in their morbid behaviors in later life. If, then, the confirmed stammerer is an instance of the persistence of nursing movements thrown in upon speech expression, how does one explain its relatively infrequent occurrence? To explain this one need but to follow up the psychoanalytic literature and the variety of significance of the child's fixation upon the act of nursing as well as the more fundamental fact of the integration of the whole personality from the identification with the mother, physically and spiritually.

I have analyzed several stammerers and in two cases I was able to verify from actual repressed data the intensive fixation upon the act of nursing and the successive alterations in the process of adaptation to adult speech. Most frequently one may not review the earliest infantile life, and then only indirectly may one obtain corroborative data that substantiates our general contention that the imperfect repression of the nursing act is the responsible factor.

The imperfect recovery of the infantile memories, of course, renders the prognosis poor as only a complete abreaction paves the way to an emotional healing. Even though the infantile fixation upon the breast is fully laid bare, the release from the speech defect is necessarily slow as the perverted speech mechanism is very deeply ingrained into the most fundamental functions of the whole organism. However, the problem is not more difficult than recovering individuals from habit tics, paranoid reactions and compulsive neuroses as well as homosexual neuroses, to all of which the speech defects are closely allied.

In a superficial consideration of the imitative reproduction of some of the sounds in various special forms of stammering, one may see in the hissing sibilant stammerer the veritable copying of the sound of micturition and the explosive discharge of flatus;* but on closer analysis such a hypothesis may be found to be the genetic foundation of the occurrence of this phenomenal form of speech defect. Before we attempt to seek such an explanation out of immediate range of the organs concerned in the defect in the majority of stammerers, one should make the one great cause, an infantile fixation upon the act of nursing, "go as far as it will," so to speak. As we have already indicated, the weaning process is a very complicated one. The first and simplest part of the process involves the coördinated use of the tongue and lips, but the second process really consists in the infant's rolling or forcing the bolus of food to the back of the pharynx and there allowing vermicular grasp of the pharyngeal muscles to act seriatum upon it. In the initial part of this second act of swallowing, the tongue takes a position which exactly reproduces all the syllabications which these stammerers show; in the latter part of this phase of swallowing, all the pharyngeal muscles, directly or indirectly, are involved and attempts to force speech during such an impasse invariably produces a variety of deep guttural sounds in the stuttering process. It is just possible, of course, that instead

* This point was stressed by Dr. Jelliffe in discussing a related paper read before the New York Neurological Society some few years ago—October 5, 1920.

of confining the fixation to the mother's breast alone, one might speak of anal erotism and thus permit the tic-like sway of the whole excretory act to come into perverted function in the speech disorder. Thus one might find ultimate sanction of invoking genital and anal eroticism in the perverse speech disorder of stammerers. However, one should not feel justified in following such a course until he has thoroughly annexed all the possible sources of the speech defect in the actual nursing act and the fixation upon the mother's breast.

Under intense emotions of love and anger the crudest reversion to the sucking movements is seen. If one wishes to note the general significance of this breast fixation in the formation of the more glaring fault of phonation and syllabication, let him but consult the photographs of the involvement of the oral and pharyngeal organs in the textbooks on stammering, such as we find in Scripture's study of this disorder, and note their similarity to the movements of the infant's mouth in the process of nursing. The majority of confirmed stammerers do not get their neurotic symptoms from their *speech impediments,* but because the greater number of such symptoms of behaviors are the result of the very process of fixation in physical and mental habits which arise coincidentally with the broad significance of a psychic trauma during the infantile period.

The majority of confirmed stammerers develop a sort of jargon before they attempt normal speech. This is not the lisping baby talk but is a midway speech which one is able to detect as formed in greater part from the most pronounced persistence of the sounds and practices of the nursing act. These children only after the most rigorous training give up this midway speech or jargon and adapt to normal speech. Under excitement they return to the jargon, and finally in extremes of emotion they relapse to the crudest patterns of nursing behaviors as previously stated.

Many of these stammerers suffer greatly from various sorts of exhaustion not only because they must take at least two hurdles in the race for free social converse but oftentimes because their whole personality unconsciously yearns backwards to the mother identification and its comforting protection and love and the personality is opposed to adult psychosocial adjustment. Of course, the individual may build large defenses in other spheres to compensate for the existence and endurance of the speech defect and the disadvantages that such a social barrier entails. History is filled with illustrations of this from the time of Demosthenes and his supposed unique experience in overcoming his speech disorder.

From the point of prognosis, one cannot see much hope for the

confirmed stammerer even though one accepts this hypothesis. First, because these subjects are often enormously narcistic and cannot make a sustained narcistic transference; in short, they are easily discouraged and float from one mechanical system of therapy to another. They resist psychoanalysis as too taxing upon the ego with its narcistic protection. Hence the infantile unconscious is rarely met with face to face, and even when this is accomplished the stammerer has usually so deeply ingrained into his personality the defective behavior pattern so-called "second nature" has taken a firm hold in spite of all our efforts at reconstruction.

If one were so inclined he might trace the origin of stammering to the mother and breast fixation by merely following up the essential symptoms of the disorder and note the mechanism of the successive involutions by which the defect has come about. As a final formulation, one of the most advanced textbooks on stammering states that it is a diseased state of mind, which arises from excessive timidity, and tends toward a condition of segregation which will enable the individual to avoid occasions where he will suffer on account of timidity. In other words, the cause for the speech disorder is unconscious. The timidity is essentially the well known inferiority or castration complex expressed in such great varieties of symptoms in ego neuroses. This sense of inferiority is known to be based upon the bisexual constitution in which the unconscious is homosexual, and the latter is dependent upon the mother's breast fixation in the child. That stammering does not invariably result from the breast fixation principle is no real argument that this is not the chief cause of stammering wherever it occurs.

In the brief illustration to follow, it will be noted that the incompletion of the nursing period, the castration effect of such a premature withdrawal of the mother and substitution of the mother by a wet nurse may be found in many stammerers. Again the simultaneous stimulation of the anal and genital zones together with the excessive manifested pleasure on the part of the nurse is often sensed by the nursing child. A typical revolt of such a child at the simultaneous stimulation of both these zones is given in the stammerer's own words. Undoubtedly the simultaneity of the anal and genital stimulation at the time of nursing not only prevented a normal elaboration of the nursing period and prematurely excited the anal and urinary erotism but absolutely stamped an insufficient cathexis of the oral pleasure, hence the fixation in this case of the enduring stammering. It may be advanced that the majority of stammerers never pass through a period comparable to the difficulties outlined

in this case and which have been analyzed into the conscious memory. This is quite true, but anything that seriously disturbs the completion of any phase of the pleasures of an emotional period in development must necessarily entail fixations. It may be that all fixations are due to an incomplete elaboration and insufficiency rather than an excess, which has been so frequently maintained in psychoanalytic research.

The patient's account is given verbatim:

"The first six weeks of my life were given over entirely to the pleasure of nursing added to the discomfort of my mother's thin milk and thin breasts. Soon after this I became so thin that a wet nurse was procured. She had a baby of her own in the hospital who was being fed by a bottle, but she gave her entire devotion to me. The first three or four months of nursing were ones of absolute comfort and bliss. The nurse had large fat arms, large breasts, and as I remember, fat feet, whose instep protruded above the top of rather worn soft shoes. I particularly liked, as I have all my life, the feeling of being held firmly, and the warmth of her arms. It never occurred to me to look up at her face. For me, her body consisted of two things—warm arms and lap and great breasts that fed me. One day I was lying completely in comfort, when two things occurred simultaneously. The nurse placed her hands between my legs from behind, giving me a feeling of physical exaltation and at the same time I caught a glimpse of her face, which was more like a boy's than a woman's, straight dark hair, hard eyes and mouth, and an expression of great pleasure in the act of nursing. The reaction upon me was extreme. I had a feeling of terrific repugnance and dislike, added to fear. I straightened out, absolutely stiff in her arms, moving my head from left to right to avoid the nipple. Her smile of sexual pleasure terrified me to my soul and I uttered a scream, when I overcame my physical paralysis sufficiently to speak at all. From that time on my life became a complicated and painful process. I would not nurse except when I was almost famished. Even her breasts and arms were repulsive to me. Occasionally when the milk from her overflowing nipple would wet my cheek or lips, I would cry aloud with terror. The whole act of being held in her arms was to me a time of great and terrible danger. I would nurse as long as I could without seeing her face. Every time that I would catch sight of it, however, I would again stiffen and refuse to continue. A conflict became present at once. While I hated and detested the source, in other words my wet nurse, which had given me the pleasurable sensation, I still had a desire for the sensation itself, entirely apart and exclusive of the owner of the hand.

I remember very well the nurse bathing me daily. When she washed the genital regions she did so with a rough cloth, often pressing lightly on the lips of the vagina. I remember looking at her with as much dislike as it is possible for a small infant to contain. The washing hurt me, and I detested the pleasurable sensuality of her smile when she washed me. However, when occasionally I would receive a semi-pleasurable sensation from the touching of the parts, I would be furious and kick the water violently with my feet so that she could not come near me. She would

often take me to ride in a white painted baby buggy, around which was painted a wreath of pink roses. I wore sometimes a white fur coat and other times a pink knitted jacket, a white wool cap or a pink knitted cap. The strings of these were always getting in my mouth and setting my teeth on edge. After the experience of seeing the nurse's face I no longer liked the taste of the milk. It was simply something to appease appetite when I was almost starving. Her nipples, which before I had taken into my mouth quite naturally, became objects of the greatest horror. I suddenly noticed that they were brown. They appeared to me to be hard and I made every attempt to nurse by taking as little of the nipple as possible into my mouth. The result was that with merely partially holding the nipple the milk would come out of the corners of my mouth, filling me with disgust. I suddenly began to feel as if I were in a separate world in which no one understood my troubles and my great problem was to keep that look of keen sensuality from the nurse's face. Before I had had the experience of seeing her face, I would go to sleep quite comfortably in the nurse's arms, with a wonderfully consoling feeling of protection. After seeing her face, however, the instant that my hunger was at all appeased, I would cry and straighten out, until she would be forced to lay me in a crib.

Probably at about ten months of age I was held on someone's knee and fed with a silver spoon from a silver cup. I do not remember who fed me. The important factor about the cup feeding is that the spoon was thrust into my mouth, hurting and cutting the corners. I was put down finally and slept possibly two or three hours. The nurse came towards me with the evident intention of picking me up to nurse. The memory of the painful cup feeding was still in my mind, also the sense of physical exaltation I had received when she had placed her hand over my hips and between my legs. I laughed, wiggled all over with pleasure, and held out my arms in an ecstasy of physical pleasure. She picked me up and sat down. My eyes strayed down to where her fat feet overlapped her slack shoes and her stockings wrinkled about her thick ankles. However, I was warm; there was a chance of the physical exaltation and of warm milk. I looked up—everything was changed; her face wore an expression of the same sensuality. I screamed, twisted, her hand went to the pleasurable place, but this combined with her expression made me almost hysterical. I screamed until I had to be put down. After I had seen my nurse's face and was still nursing, she made various attempts to make me hold the nipple, as I had before. She would press the nipple into my mouth against the roof, where it would hurt me very much, or far back near the end of the tongue. Both of these acts would hurt, frighten, and make me seasick. My entire period of nursing, after once seeing her face, had but one idea: to appease, but never to satisfy my hunger, as I wished to get away from her as soon as possible. During this entire period I would have moments of seeing her face when the paralysis and stiffening would occur at once. My babyhood until she left, was one of horror and constant fear. I would wake up in the middle of deep sleep, trembling with fear lest I was lying in her arms, nursing.

The first words I spoke were jargon. I had a complete language of my own in which I always thought. My mother did her best to get me over this and into using English words; but father thought it amusing and would speak

it himself at times. I would think in my own jargon, and then translate it in my mind into the English words which my mother used. I did not speak English completely until I was almost six years of age. Some of the words were as follows: fish were *chef;* doctors—*guttages;* swallows and seagulls were *dips;* and other birds were *bydfys;* water was *gubbagah;* and going to the toilet was *gahgah;* horses were *highflies;* flowers were *tiny grows;* grass was *straightgrows;* peaches were *pums;* and plums were *wed pums;* green peas were *shells;* dogs went by the ordinary children's name of *bowwows.* I hardly ever used an "R"; it was years before I said "bureau"—*bwuwows.* Medicine was *bwown;* I had literally thousands of words, but so constant was the family repression that I have forgotten most of them."

In conclusion we may advance the suggestion that all stammerers are oral erotics but as this form of infantile fixation is really but a part of the character distortion from the three great sources of its formation, *i.e.,* the oral, the anal and the urinary erotism, the oral character formation is always interwoven with other reaction formations against the primacy of the instinctive impulses to nurse, to soil and to void. This fact accounts for the clinical variations in stammering as well as the varieties of makeup. The main accent must, I believe, be placed upon the varieties of oral erotic behaviors. With the considerable research that is now being directed toward character analysis derived from the infantile unconscious and from the pregenital stages of sexuality we may hope soon to be in possession not only of a more accurate delineation of the exact fault in each stammerer but also to be able to bring forth a therapy which will more radically eliminate this truly distressing speech disorder. However, here as elsewhere we shall find that the essential fault is not more disastrous in the particular syndrome which we seek to relieve but rather is a profound character defect or distortion which makes the situation as a whole a truly great psychopathologic problem in ego neuroses. As a final word I may add that those interested in bringing to light the infantile unconscious of the first year of life may find useful my phantasy method of analyzing this period in the narcistic neuroses, soon to be published.

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

The Four Hundred and Twenty-fourth Regular Meeting Was Held in Coöperation with the Section of Neurology of the Academy of Medicine, December 8, 1925, and Commemorated the Centennial Celebration of the Birth of Charcot. Dr. McKendree, Chairman of the Section, Presided.

SYMPOSIUM DEVOTED TO CHARCOT

Charcot and the Salpétrière. Lantern Slides and Exhibits
Lt. Col. F. H. Garrison, Washington, D. C.
(By Invitation)

(*Author's Abstract*)

Slides were shown exhibiting

1. Photographs of Charcot taken in 1860 (aet. 35), 1863, 1872, 1878, and later. Also the medallion by Paul Richer, the humorous drawing by Paul Renouard, and a portrait of Charcot in the robes of the Paris Medical Faculty.

2. Drawings made by Charcot himself, *viz.*, a caricature of himself and his colleagues of the Paris Faculty in Indian file, and sketch of a patient afflicted with paralysis agitans. Specimens of porcelain decorated by Charcot.

3. Two views of the Salpétrière.

4. Picture of Duchenne of Boulogne, whom Charcot regarded as his master in neurology.

5. Pictures of typical hysterical patients at the Salpétrière.

6. Photographs from the old *Iconographie photographique de la Salpétrière* (1877–1880), showing the passional, ecstatic and cataleptic attitudes which characterized the "major hysteria" of this period. Charcot demonstrated and classified the same symptoms in paintings and drawings of the 16th and 17th centuries, representing the "possessed" (demonomania). They are also displayed in the bacchantic postures of Maenads and Corybantes on Greek vases and bas-reliefs.

7. Photographs from the *Nouvelle Iconographie* (1888–1916), showing the facies in exophthalmic goiter, acromegaly, hereditary ataxia (Friedreich) and the muscular dystrophies (the myopathic or amyotrophic face of Marie and Richer); the attitudes and deformations in poliomyelitis, primary lateral sclerosis (spastic paralysis in children), acromegaly (the succulent hand), and paralysis agitans (statue by Paul Richer); also the physical habitus in chronic heredi-

tary trophoedema (Henri Meige) and a group of statuary of Paul Richer, showing the physical habitus of women in classical antiquity, the early Renaissance period and modern times. An attempt was made to present Charcot as an exemplar of the straight Hippocratic trend in medicine (*i.e.,* spontaneous approach to clinical problems without preconceived hypotheses).

The author's bibliographical account of Charcot is published in *Internat. Clinics,* Phila., 1925, iv, 244–272.

THE CHARCOT CENTENNIAL IN PARIS. REPORT OF THE DELEGATE OF THE SOCIETY

M. Allen Starr, M.D.

Dr. Starr said that before speaking of the Charcot Centennial he wished to make a statement or two which seemed warranted. The popular notion of Charcot centers around his studies on hypnotism and hysteria, and Lt. Col. Garrison called particular attention to those contributions to the functional neuroses. But Charcot was primarily a pathologist, and his work in organic nervous disease was his more important work. This should be emphasized in justice to Charcot, because there is a certain amount of criticism of anyone who devotes himself largely to the study of hysteria or to hypnotism. His work during the early part of his career was almost entirely pathological. His thesis for the doctorate of medicine was on Arthritis Deformans. His first important contribution was on "Chronic Ulcerative Pneumonia." In the first ten years of his career, from 1863 to 1872, his attention was almost exclusively confined to pathological investigation. Having gone over the large field of pathology, he centered his attention on the pathological side of the nervous system because at that time practically nothing was known in regard to the pathological changes that go on in nervous diseases. Any Practice of Medicine published in 1875 mentions only three diseases of the spinal cord: myelitis, locomotor ataxia, and anterior poliomyelitis. Charcot began his work in the pathology of the nervous system in 1872, and continued it from that time on. The important work that he did was pathological and it was largely in connection with the pathology of the spinal cord and the brain that he made his reputation. In 1872, 1874, and 1876 wonderful investigations came out from Fritsch and Hitzig in Berlin and from Ferrier in London on the localization of functions in the brain, and in the following year Charcot made important contributions to the subject.

I was a student of Charcot in 1882, and I never saw but one case of hysteria demonstrated in that whole semester. He was talking about brain tumors and aphasia, word blindness and word deafness, and drawing those diagrams of the brain we are all now familiar with. I think this side of his life should be emphasized because the majority of people pay much more attention to Charcot's studies on hypnotism and his interest in these hysterical symptoms which after all he misinterpreted in many cases because it was later shown that a good many of these young girls were acting for his benefit.

I am now going to give you an account of what happened in Paris in May. The French government, unlike our own, takes a certain amount of interest in scientific progress and in her scientific men. France has celebrated the activities and the achievements of Trousseau and lately, of course, of Pasteur. The French government has thought it wise to dignify the memory of her men by proper memorials. During their lifetime they are decorated by their government. After their death their memory has been perpetuated, and therefore it was not unusual for the French government to celebrate the 100th anniversary of the birth of Charcot. It did so at the instigation of the Academy of Medicine of Paris and the Society of Neurology of Paris. The French government communicated with nineteen different countries, and eighteen of them sent official delegates to the city of Paris in the month of May. The Society of Neurology particularly designated certain gentlemen who happened to be members of their Society and who would be *personae gratae* to the French government. From this city they were B. Sachs, J. R. Hunt, C. L. Dana, S. E. Jelliffe, and myself, as being corresponding members of their Society. I was the only one able to attend. There were 700 physicians gathered from all over the world. The first two days of the meeting were Monday and Tuesday, and the scientific meetings were held at the Salpétrière, from 9 to 12, and 3 to 6. The first day was given over to the consideration of what is known as Charcot's disease, amyotrophic lateral sclerosis. The pathology was described by Marinesco; the clinical history was given and discussed by Christiansen of Stockholm and Winkler of Amsterdam. The second day was given over to the study of migraine, to which Charcot had made some contribution. This was dealt with by Neri of Rome and by the younger Pasteur. Those were the two scientific meetings of the Congress.

Then there were official meetings given by the French government. The first was very impressive. It was in the great hall of the Sorbonne, which holds 3,000. The President of the French Republic came in with a band from the National Guard playing the Marseillaise, escorted by the Hussars, each man over six feet four inches tall. The President and the Minister of Education presided. The latter made a very charming address, and introduced Babinski, who was the first successor of Charcot in the Chair of Nervous Diseases at the Salpétrière. Babinski read a very interesting address describing Charcot's personality, with many details of interest in his life. This was followed by a presentation of their credentials by the different members of the various countries represented. It was thought best not to have eighteen different addresses, and a representative was selected from among them, Marinesco being chosen as being a particularly interesting and eloquent old gentleman, and Winkler of Amsterdam to represent the various universities that sent delegates. Sir Robert Sinclair, the representative of the Royal Society of London, also made an address. It was altogether a very brilliant occasion. The speeches were interspersed with music.

The next official celebration was on the following day at the

Academy of Medicine. Pierre Marie gave the address; he was the successor of Charcot after Raymond and Dejerine. The address was full of feeling and full of deep personal attachment to his old professor; there was a personal note in it that really moved the emotions of every man in the room.

The third occasion that was of interest was the banquet. Seven hundred sat down to this; speeches were made by the Minister of Education and by the various delegates, each being called on in turn to make a short address. Almost every delegate not only alluded to Charcot and his work, but also made some reference to Charcot's family, because at the center of the table there sat Commander Charcot, who was his son, and is a member of the Navy, although he was educated as a physician, and much to the distress of Charcot gave up the practice of medicine and went into the Navy. He has made a world wide reputation as a discoverer of the Arctic and Antarctic regions. He was the first to approach the South Pole before Shackleton got there. At the end of the addresses Commander Charcot rose and delivered a most touching speech, thanked everyone for the homage that had been paid his father, and gave us a delightful picture of his father's family life which of course no one else would have been able to do, and as a culmination of his address, he invited the delegates to tea at his father's house at Neuilly on the following afternoon. There he and his sisters received us. The library is much as Charcot left it, and is decorated by frescoes made by his hand; the tiles about the mantle were painted by him.

The last reception was given by the city of Paris at the Hotel de Ville at 4 in the afternoon. The Mayor of Paris was present. At the close of the meeting a medal was presented which had been struck off in commemoration of the centenary of the birth of Charcot. As a celebration it was an enormous success. I think it is a great thing for a country to recognize in such an official manner the centenary of one of its greatest men.

CHARCOT, THE HYPNOTIST AND DIAGNOSTICIAN

BERNARD SACHS, M.D.

Dr. Sachs said: I regret that the program reads "The Hypnotist and Diagnostician." I very much wish to have that reversed. Charcot was above all things the great diagnostician. I think I can fulfill the purpose of the evening best if I give you some personal impressions of Charcot as a teacher at the time that he was at the zenith of his scientific career. Dr. Starr and I are the only ones in this room old enough to claim that they were students under Charcot. Starr and I sat together on the benches under Meynert, and Freud was our neighbor. I got to Paris in the spring of 1883; Dr. Starr was a little ahead of me. Let me recall to your minds that at that time the guiding spirits so far as neurology was concerned, in Germany, were Leyden, Erb, Strümpell, Flechsig, Nothnagel and Wernicke. In Great Britain Hughlings Jackson, Byrom

Bramwell and Ferrier were the luminaries. In America the names of Weir Mitchell, Beard, the elder Hammond and Seguin were known to all. In France there was only one name that dominated the entire field of neurology, and yet Charcot was surrounded by a brilliant group of younger men. During the years from 1880 to 1893 in France there was not a book published on any neurological subject that was not either dedicated to "Mon Maitre, Charcot," or written at the inspiration of Charcot. The preëminence which Charcot enjoyed at that time was deserved, if ever any man deserved to be the master of an entire science. Coming from the laboratory of Meynert, great anatomist as he was, but a rather poor teacher, it was a privilege to sit at the feet of a man like Charcot, who was the most inspiring of clinical teachers. He had a way of making the most uninteresting fact in medicine interesting. I can recall his Napoleonic head, his classic features, his beautiful hair; there he sat during the lecture surrounded by his group of assistants. A good many of the men who had graduated from the Clinic itself continued to attend almost every clinic that Charcot held, and particularly those famous Tuesday morning clinics. A foreign student was admitted to the clinic without trouble, and easily fell in with the group of men from every corner of the globe who were content to listen to the oracle. At the time I went to Charcot for instruction in neurology he was the great exponent of organic neurology. Like most of the neurologists of that time he was graduated from the ranks of the internists and the pathologists. The work for which Charcot was already famous was that on tabes and on the amyotrophies, on the progressive muscular dystrophies, on disseminated sclerosis. The differential diagnosis between paralysis agitans and disseminated sclerosis was due to his clinical acumen. Then there was his work on poliomyelitis, on myelitis, and above all, the subject that so many of us were interested in, the work on cerebral localization.

I can remember one special occurrence, and it was this I had in mind when I said I was going to speak of Charcot as a diagnostician. While discoursing on cerebral localization he brought in a patient who had been a chief flutist in one of the Paris orchestras. He presented the man to show the loss of one special function. The patient said the reason he came to consult Charcot was because he could no longer pout his lips in such a way that he was able to produce a perfectly pure not on the flute. Charcot said it was the finest example of localization of function that we could possibly have. He said: "But it is not due to any cortical trouble, such as you have been thinking of. That man has no tumor. That is the first stage of a general paresis. It is this man's most highly specialized function, and it is the first to go." It was by that method of clinical contrasts that he had a way of impressing his students and of making his lectures dramatic to a degree.

I can also bear witness to the fact that during the year I was there hypnotism did not play the rôle that it was supposed to have done in Charcot's clinic. Before referring to hypnotism, it is necessary to speak of the work on hysteria. When we, as students, went

to Charcot to study hysteria, we went there under the impression that it was a very marvelous thing that a man who had all his life devoted his time to organic neurology should begin to devote himself to the neuroses. I remember his presenting some extraordinarily interesting cases of hysteria. Charcot, however, was bent upon finding the analogy between hysteria and organic disease. It may seem queer to us at this day that whenever he spoke of hysterical hemianesthesia he was constantly trying to find what actually happened in the brain to bring about such a condition. In his lectures on hemianesthesia he finally states that he does not know what the underlying changes are. We were under the impression as students under Kussmaul and Leyden that there was something strange about the occurrences in Charcot's hysteria wards. Everyone had doubts as to whether the thing was not manufactured in Paris for special French use. It is perfectly true that the things seen at the Salpétrière were not to be seen anywhere else. I remember the following incident. It was after one of his lectures on hysteria that the entire class was taken up into one of the small wards, in which there were twelve or fifteen female patients. There were some of the students on one side, and the assistants on the other, and it happened that a passage was made for Charcot to pass through the middle. The moment that he was seen by the patients in that ward, the entire ward fell into a hypnotic state, every patient presenting some form of hypnotic trance. In some of the universities in Germany it was said that such occurrences were all prepared, and that Charcot trained his material so that they did anything he pleased. Charcot at that time was aware of the fact that there was no deception about this, but his personality and his relation to the patients were such that his appearance acted as a powerful suggestion, and the hypnotic state was the result of this powerful suggestion. Charcot tried in every instance to reveal the cause of the hysteria. One of the most interesting cases he has ever published is an entire chapter, or perhaps two, on hysterical anuria. He proves conclusively, even to the reader of the present day, that there is such a condition as hysterical anuria. His argument shows that in studying hysteria he was chiefly interested in determining what brought about the hysteria. The original psychic shock in the case of hysterical anuria was experienced at the time when this patient had fallen into an open fire; from this time on she developed the hysterical complications. The whole subject of hysteria was treated by him in such a purely scientific manner in its relationship to organic disease that we can well afford to accept many of the explanations that Charcot gave us of these hysterical phenomena. There is only one circumstance that challenges criticism. Many of the patients were detained for ten to twenty years at the Salpétrière. Evidently in the majority of cases no serious attempt was made to cure them. This was surely due to the fact that Charcot and his followers wished to retain them as good clinical material for teaching.

Let me add just one word that is true not only of Charcot and his influence as a teacher, but is also true of the entire French manner of handling the subject of neurological education. Pierre

Marie at this day, who is a most delightful successor to Charcot, sees every patient in person in the Out-Patient Department. There is much more to learn about nervous disease from out-patient work than from hospital work. That is also true of a good many other diseases. The man who studies heart disease in a hospital ward will not learn as much of the origin of the heart disease as the man who sees dozens of early cases in the outdoor clinic. The importance attached to the out-patient work in France is accentuated in the neurological education, and I think we can well afford to emulate that example by making the out-patient neurological department an integral part of the Hospital Division.

The Neurological Society and the Neurological Section of the New York Academy of Medicine have done well in realizing the services rendered by Charcot and in doing reverence to the memory of the greatest Master Mind in Neurology.

Discussion: Dr. M. Allen Starr described the famous Tuesday morning lectures, which were held in a long, narrow hall with benches rising from the floor. After the audience had gathered on these benches, the side windows were closed by shutters so that the room was in complete darkness. There was a stage at one end, and the footlights were turned on. Charcot entered from the side with a number of his assistants, and seated himself at a little table which did not face the audience, but faced across toward the stage. Then an assistant brought the patient in and placed him in front of the footlights, and the calcium light from the other side was flashed upon him, so that he was the center of the only light in the room. Then Charcot began to discuss the case, to read the history, and the students could see everything that he wanted them to see. If it was a case of shaking palsy it was put in the limelight, and pretty soon other cases of tremor were brought in and placed along the footlights so that we could see the different kinds of tremor. The patients were then ushered out and the footlights put out, and then lantern slides were flashed on the screen to show the lesion, so that the symptomatology, diagnosis, and the lesion were all before the students. That was a dramatic clinic. Some people criticized it as being too dramatic, but it taught the student.

CHARCOT AND THE ARTS

Charles L. Dana, M.D.

Dr. Dana, who, because of illness was unable to be present, sent to the Academy a large collection of pictures for projection which were shown, with running comments, by Dr. Jelliffe and Colonel Garrison. Dr. Dana's pictures showed particularly a phase of Charcot's artistic taste, viz., his study of the products of great artists who had depicted various striking symptoms of disease and early surgical procedure. Projectoscope illustrations were shown of portraiture of disease, by Dürer, de la Robbia, Rembrandt, Rubens, Velasquez, Teniers, Jr., Brueghel and others, chiefly by Dutch, Flemish, and Austrian artists.

Discussion: Dr. Smith Ely Jelliffe said that he had had the pleasure of listening to Charcot in 1891 in the same lecture room Dr. Starr had so well described, and also had known personally all of the successors to the chair after Charcot's death; Brissaud, who served for a year only but was not technically successor; Raymond, who from 1894 to 1910 was his successor. He had spent six months with Dejerine, who served from 1910 to 1917, and had first met the next incumbent, Pierre Marie, in 1904, at the Bicetre. Professor Marie was professor from 1917 to 1923, and was followed by Georges Guillain, whom many of the neurologists of this country knew, since he had visited the United States and participated in a meeting of the American Neurological Society.

He complimented Dr. Starr upon his most pleasing presentation, and as he himself had been requested to serve as a delegate also, all the more keenly felt his regret at not having been able to attend.

As regards Dr. Dana's pictures, Charcot had assiduously gathered many illustrations of a vast number of facial contortions, bodily postures, etc., which indicated the influence of the emotions upon bodily movement. As Sherrington has reminded us, "emote" is the root of the word, meaning that bodily movement is but an emoting of feeling. The popular folksong "Every little movement has a meaning all its own" perhaps contained more science than one was apt to attribute to it. The studies of Darwin, on the Expression of the Emotions in Man and the Animals, and that of Hughes, on Mimicry in Man, were alluded to as classical texts. Some of the neck positions and "stell reflexe" described by Magnus and de Klein, were illustrated; and certain psychotic, catatonic, and other attitudes were related to the psychological states which permitted such emoting.

Charcot mementoes, photographs, and literature have been on exhibition at the New York Academy of Medicine for several months.

BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY

Regular Meeting, November 19, 1925. Wm. Healy, M.D., President, in the Chair

MALARIA IN THE TREATMENT OF GENERAL PARESIS

H. C. Solomon, M.D., and Arthur Berk, M.D.

The treatment of paresis by the inoculation of malarial blood was first introduced by Professor Wagner von Jauregg, chief of the psychiatric clinic at Vienna, in 1917. However, as early as 1887 he had suggested its use in an article reviewing the literature "on the influence of febrile diseases on psychoses." In this article he stated that Hippocrates was acquainted with the art of "healing" of psychoses by febrile diseases and that Galen cited a case of cure of

melancholia by intermittent quartian fever. Verga, Gaye, Wille, and Sponholz are quoted as not enthusiastic about the matter, but Campbell, Rosenbloom, and many more are quoted as favorably impressed with the action of such febrile diseases as typhoid, cholera, and intermittent fevers, the acute exanthema, erysipelas, pneumonia, etc., upon the psychoses.

With the idea of getting beneficial results from the induction of fever, Wagner von Jauregg began using Koch's old tuberculin for the treatment of general paresis in 1890, and continued this type of treatment until it was superseded by malaria. The patients were given increasing doses of tuberculin subcutaneously three times a week and allowed to go through 8–12 rises in temperature. This was followed by mercury. The course of the disease in these treated cases was compared with the course of an equal number of untreated cases, and it was reported that the length of life of the treated cases was longer and that a greater number and more lasting remissions occurred. This work was confirmed by Pilcz.

In paretics in whom tuberculin was contraindicated, Besredka's typhoid vaccine was used. This was given intravenously every other day, and the same rule as in the tuberculin treatment was followed out and very satisfactory results were recorded. Then staphylococcus and streptococcus vaccines were used by him, but it was given up because the remissions were of short duration. In 1909, Donath of Vienna and Fisher of Prague treated paretics by intramuscular injections of sodium nucleinate as a method of producing fever, but this, too, was abandoned on account of pain, suppuration, and no better results.

Throughout the course of the various treatments Wagner von Jauregg thought that the best results were obtained in the treated cases that developed an intercurrent febrile disease. This circumstance roused him to the thought of directly producing an artificial infectious disease in paretics, and starting from this consideration he turned back to the proposal he made in 1887, and in 1917 nine paretics were inoculated with malaria.

Since the institution of malarial treatment certain interesting observations concerning the effect of acute diseases in modifying a chronic disease have been collected. Delgado states that from ancient times it has been the custom of Peruvian natives suffering from uta-a leishmaniasis of the skin and mucous membranes to repair to certain localities where malaria is endemic, the tradition being that after a number of attacks of malaria the lesions of uta cicatrize and are cured. Bercovitz states that in countries where syphilis is very common and where malaria is practically universal, as in Indo-China, symptoms of neurosyphilis are rarely seen. This would seem to fall in line with the work of Mathauschek and Pilcz, who in 1913 reported that in their series of 4,134 army officers who acquired syphilis, the anamnesis showed that 241 had an acute infectious disease during the first few years of their specific infection, and of these not one developed general paresis, while on the other hand, of 195 who did develop general paresis hardly one gave a history of having had an acute

infectious disease such as malaria, pneumonia, erysipelas, etc. But Kirschbaum reports that in his clinical material he found ten general paretics who had malaria during the secondary stages of their specific infection, and in our own series there was one such case.

There is no established principle by which the improvement of general paresis by malaria can be explained. It is based purely upon practical experiences and observations, but hypotheses for the action of malaria upon general paresis have been suggested. Plaut proposed the idea of an immunity reaction; *i.e.,* that the host infected with malaria produces antibodies or other substances which act against the spirochete pallida. Another theory is that the body temperature is the factor chiefly responsible for the favorable effect exerted by the intercurrent infection, and in connection with this the experiments of Weichbrodt and Jahnel are interesting. They found that by placing rabbits infected with syphilis in an oven at a temperature of 107.6 to 110° F. (42–43° C.) for an hour, and repeating not less than three times, a complete disappearance and death of spirochetes present in scrotal chancres of the animals resulted. It is known that the spirochete fails to grow at temperatures in excess of from 104–106° F. (40–41° C.).

Our own series consists of 30 paretic patients treated by malarial inoculation, 4 of whom are undergoing treatment at the present time and, hence, cannot be considered. Of the 26 patients, 3 have died, 6 have revealed no improvement, 5 show slight improvement, 6 moderate improvement, and 6 are apparently definitely improved. We feel that it is much too early to place the patients in the grouping of complete remissions, moderately good remissions, etc., and we, therefore, classify them merely as improved or unimproved.

In conclusion, we wish to mention that this is only a preliminary report made on account of the prevailing interest in the malarial treatment of paresis, and no attempt is made to formulate definite conclusions as to results. However, we do feel ready to state that our experience seems convincing that the course of paresis is definitely modified by malaria and that not a few patients are markedly benefited.

Discussion: Dr. C. Morton Smith: I have had no personal experience in the application of malaria in the treatment of general paresis, but some of my patients received the treatment in New York. I saw a man this morning who has tabo-paresis but has not had the malarial treatment. He was infected with syphilis in 1904 or 1905 and received mercurial treatment for four years at the hands of an excellent practitioner. He was pronounced cured and in condition to marry, which he did in 1909, and he has three healthy children, according to his description. His wife has never shown symptoms of the disease. In 1908, four years after his infection, while in the Philippines, he had repeated and severe attacks of malaria. His first intimation that the disease was at all active was three years ago, when his Wassermann, which had been repeatedly negative, became positive. He received a short course of treatment at that time. The Wassermann reaction became reversed, and his treatment was then inter-

rupted until last year, when he had a lumbar puncture which showed a positive fluid, and he received six intraspinous injections of salvarsanized serum. He still shows a fairly high cell count, a paretic gold sol curve, and strongly positive blood and spinal fluid Wassermann in spite of the early malaria acquired in the Philippines. It will be interesting to see if there are a greater number of remissions or remissions of longer duration in these patients that have been treated with malaria than can be shown with other forms of treatment. The remissions that Dr. Solomon obtained with intensive treatment with intraspinous and intraventricular injections of salvarsanized serum were quite as striking. I should like to have Dr. Solomon mention one case, if he is willing. It is the most striking case with a long remission that I have ever seen. I should also like to inquire if there has been any difficulty in continuing or controlling the paroxysms of malaria. Treatment of paresis with malarial inoculation is an extremely interesting subject, but the principle of treating one disease by inoculating living germs of another infectious disease should not be widely applied at present. It is not a procedure devoid of risks. Drs. Solomon and Berk are to be complimented on the fair-minded presentation of this work.

Dr. E. W. Taylor: I should like to ask two questions. First, I wish we might hear from Dr. Solomon about the relative danger in this method, from his experience. Some observers have felt that it was a dangerous method of treatment and various complications might arise which would not occur under ordinary treatment; the other question, whether or not in these cases that do so well there are changes in the spinal fluid.

Dr. Donald Gregg: Are these cases being treated by malaria inoculation alone, or is this being carried on in connection with mercury; and is there any relationship between the height of the temperature reaction to the malaria and the tendency toward remission?

Dr. H. C. Solomon: Dr. Smith's first question concerned the spontaneous cessation of paroxysms. This happens not infrequently. A patient will have paroxysms every day or every other day, and then the rises in temperature cease, in spite of the fact that organisms may be found in the blood. We have had this occur a number of times. We have tried to start it up by the injection of boiled milk. We have succeeded in getting a few patients to start paroxysms again by doing this. One or two patients have been given quinine and reinoculated. One patient was given boiled milk without any result; the malaria was then stopped with quinine; he was reinoculated, but paroxysms did not occur until he was given typhoid vaccine intravenously, after which the malaria became active again. Dr. Smith asks about one of his patients treated in 1919. This patient made a very good recovery with intraventricular and intraspinal treatments and went back to his position as city engineer in about eight months, and his serology is now completely negative. A question that is frequently asked is whether intellectual acuity returns in a remission. We have been checking this by psychometric tests,

thus: one man in 1923 had an intelligence quotient of 59; at the end of a year it was 70, and a year later it was 90. This went along consistently with clinical improvement, and now we have finally succeeded in getting a negative spinal fluid, but it has taken us three years to accomplish it. Dr. Taylor asks about the danger. Malaria is a serious disease. The patients are sometimes very sick. You can well imagine it, if you see a patient with a temperature of 106° F. or 107° F. with tremendous rigors and perspiring copiously. Twice we have had to stop the malaria because of jaundice. The linotype operator, whom you have seen, had jaundice, wherefore the malaria was stopped. Later he was reinoculated, but again it was necessary to stop it because of jaundice. Nearly all patients develop a considerable degree of anemia, but that is of little moment, and in a couple of weeks the blood is back to normal. The condition of the heart has to be taken into consideration. With a temperature of 106° and 107° the heart is undergoing a considerable strain. We have selected our patients with some care. We have taken no patients with blood pressure of over 170, none with marked cardiac lesions or nephritis, and I think that accounts, in part, for the relatively low mortality. One patient did die. He developed hematuria; he had only one paroxysm of malaria, and we stopped it because he was doing so badly. Another patient afforded a good contrast. He was chosen for malaria treatment, but on account of his general condition, it was not done. Both died the same day. The first had one paroxysm of malaria; the other had no malaria, and his death could only be considered as the result of paresis. The treatment of one patient with hemiplegia was stopped after he had five or six paroxysms, but when he got back in good condition we gave him another course. He has done very well mentally, and while he is not at work he is a very companionable sort of fellow and could go to work. From our own experience we cannot say much about the effect of malaria on the serology because we have been following the malaria by tryparsamide. So what changes we have to report are of no importance because they may have been caused by agents other than the malaria. Bunker and Kirby have not treated patients with drugs afterwards. They have followed them up with subsequent lumbar punctures, and they claim marked serological improvement. The serology does not change much in the first few months, but later, apparently, it does. When a patient is through with the course of malaria we give him quinin and arsphenamin and continue treatment with tryparsamide. Most of the literature on the subject that was mentioned was from 1924, but a great deal of the work reported goes back to 1919 and even before. It still is too early, however, to evaluate these results, and I do not believe anyone will attempt to do so now. Only three of our patients had other types of treatment previously. I do not think that the malaria treatment should be used in general hospitals because the patients frequently become noisy and disturbed during treatment and need the facilities of a psychiatric hospital. We have used malaria in no other than the paretic type of neurosyphilis. In conclusion, I should like to

emphasize one or two things. I think it has been clearly demonstrated that the malaria treatment modifies the course of paresis. It is a new departure in therapeutics, the attempt to cure one disease by another. We have treated patients with drugs, chemicals, vaccines, sera, and now finally we come to the consideration of the treatment of one disease by the inoculation of another disease. It does do something to alter the metabolism of patients with paresis.

CASE OF APPARENT DETERIORATION WITH ODD BEHAVIOR BUT WITHOUT TRENDS

Julia Deming, M.D.

This is a patient of twenty-four (patient demonstrated) who comes from a laboring family. Delivery was instrumental after 36 hours labor. He is the oldest of six children all of whom are normal.

He did not play as actively as the other children but stayed by himself somewhat. He had pneumonia as a child and "sciatica" in February, 1919. He complained of vague joint pains for five months after this but had, according to the doctor, no temperature at this time.

He finished grammar school without undue trouble but at fifteen he flunked the first year of high school.

After this he had a number of jobs demanding a low type of work such as mechanics' helper, wood polisher, and book carrier in the public library. He is said to have been *slow* at this work and had *difficulty in getting to work on time*. He has done no work for two and one-half years.

He has always been quiet and seclusive, keeping to himself, not going to dances or parties. He went alone to the movies and even skated alone. He took no interest in girls and has shown no sex interest in his fellows.

During the past two years he has been noticed by his family to have been still slower in all movements. He has shown extreme fondness for sweets; in the hospital he occasionally hides cake or bread on his knee at the table. He has been seen by his brother standing in the street staring into space or shaking a fence. He took a clarinet out and pawned it for $2.00. He walked the streets all night on several occasions. A year ago he began showing repetitive movements in eating and dressing, going on with the movements of eating after the plate and cup were empty. He also showed repetition in his speech.

Admitted to the Psychopathic Hospital, February, 1925, he showed fairly frank, coöperative behavior with repetition in actions and speech. It takes him a very long time to dress as he makes many uncompleted motions such as reaching for his shoes several times, half putting them on, then taking them off. When he hangs up a garment, he may have it on the hook three times before leaving it there. In eating there are not so many uncompleted actions but he goes on with them after the dishes are empty. He has been noticed

to insist on having his shoes at a certain angle before going to bed and has been seen to rearrange the chairs on the ward with special care. He has masturbated but seems to have no conflict over it. He denies having had heterosexual experience. His memory is good, he denies hallucinations, he does not tend to distort the external world. He has insight into his peculiar behavior and personality. He says he is shy and embarrassed in a crowd, that he feels that he is not yet a man but will be at twenty-five. He has spoken vaguely and without elaboration of an " influence " over him.

Physically, he shows a dolichocephalic head with small low-set ears and a rather heavy under jaw. His tendon reflexes are a little slow, his skin is soft and fine, his hair distribution is male in character. He has a refractive error. His blood pressure is low, 100/65. X-ray of the head shows blood vessel grooves prominent, sella turcica large and deep but not definitely pathological. The phalanges show a question of some tufting. X-ray of chest shows supra cardiac shadow probably due to a wide aorta as it does not have usual conformation of the thymus.

His blood and spinal fluid Wassermann are negative. The spinal fluid sugar was .057 gram per 100 c.c. and protein .019 gram per 100 c.c. The basal metabolic rate was minus six. A sugar tolerance test showed blood sugar as follows: Fasting, .086 gram per 100 c.c.; first hour after ingestion of 1.75 grams of glucose per kilo .116; second hour .089, and the third hour .123. At the time the fourth sample was taken the patient was found eating.

His upper teeth have all been removed and three lower teeth show apical abscess. He refuses extraction.

A psychometric test done 2/17/25 gave him a Stanford mental age of eleven years seven months, with an intelligence quotient of 72. He was poor on memory span for digits forward and his memory for visual form was poor. This was repeated 4/23/25 when he was given a mental age of thirteen years five months with an intelligence quotient of 83. The examiner felt that he showed improvement in his ability to handle constructive thought. Hypnotic suggestion was tried on the patient without results in regard to speech or action.

We have here a boy who gets along fairly well up until fifteen, who carries on at low types of laboring jobs with decreasing efficiency up to the age of twenty-two, who becomes noticeably slow, shows repetition in his movements and speech and begins to show queer types of behavior such as walking the streets at night, staring into space, shaking a fence and pawning his clarinet which he had heretofore prized. He gives up work entirely at twenty-three and is content to sit around home allowing the family to support him.

This behavior seems aimless and to show a lack of judgment. No trends have been elicited which might be considered as a driving force. We therefore consider him a case of apparent deterioration with odd behavior but without trends.

Discussion: Dr. C. Macfie Campbell: This case has given us a great deal to think about; it interests us very much. The history shows that the patient had gone along up to fifteen years of age

after which he took up work outside, when we find him working very slowly, not able to keep his jobs very well. Then we find odd behavior; he was sometimes seen for an hour at a time gazing blankly into space. He wanders around at night, wants to be by himself, and then finally he develops a series of odd mannerisms or repetitive movements, or compulsive movements, when he does things two or three times, or when he goes through a little ritual in regard to arranging his shoes or fixing the chairs in the wards. What relation has this case to other types of deterioration? The question is, are we dealing with some vague reduction on an organic basis, as yet undemonstrated or do we have some more subtle undermining psychological disorder which has not come to the surface in a form that is at all clear? The case interests us very much in regard to the whole problem of deterioration in the so-called functional psychoses.

Dr. E. W. Taylor: Can the patient write any better than he can speak?

Dr. Deming: He has some difficulty at times in getting started, and he writes slowly.

A CASE OF ENDOCRIN DISORDER WITH MENTAL SYMPTOMS

Karl M. Bowman, M.D.

Mrs. E. K. (patient demonstrated), a white female of fifty-three years of age, widowed, was admitted to the Boston Psychopathic Hospital on March 20, 1925, from the Boston City Hospital with a statement that she was very obese, talked in a peculiar, husky voice and was demented. It has been impossible to obtain a satisfactory history but the following record is approximately correct.

There is nothing of importance in the family history. It is probable that her birth and early development were normal and that she was stout as a child. She did poorly in her studies and barely learned to read and write. She has always been defective mentally and would probably have been classed as a low grade moron. Her menses were established when fourteen years of age. They were irregular and painful. She was married when eighteen and weighed 140 pounds at that time. When twenty-one years old she had an operation for "ovariotomy" at the Massachusetts General Hospital. Since then she has become very stout. She is also said to have developed mental symptoms, mainly that she has been very suspicious. She has received thyroid medication at various times, often taking eight grains daily. In April, 1923, she was studied at the Massachusetts Homeopathic Hospital. There it was felt that the abnormal distribution of fat, the lowered threshold of the tolerance for galactose, and the low basal metabolism all pointed toward a hypergonadism.

Under observation here the patient has been quiet and orderly. She seems happy and talks freely to everyone, showing a very childish behavior. She is disoriented for time and place and shows

marked impairment of the intellectual functions. There are auditory hallucinations. There is a history of delusions of persecutions but her statements concerning this are now vague and contradictory.

On admission the patient was five feet one inch tall and weighed 254½ lbs. She complained of pain and felt weak so that she spent considerable time in bed. The skin generally was smooth and fairly moist except over the arms and legs where it was somewhat dry and scaly. Beneath the skin were many nodules like a diffuse lipomatosis. There was no axillary hair and very scant pubic hair. On the head the hair was coarse but fairly thick. The voice was hoarse and raucous like a typical myxedema. There was some deafness of both ears. Blood pressure was 100 systolic and 70 diastolic. X-rays of the skull showed a normal sella turcica. The tips of the terminal phalanges were somewhat tufted. X-rays of the teeth showed two apical abscesses for which she has refused treatment.

The urine has frequently shown a trace of sugar and occasionally albumin and casts. The specific gravity has usually been low rather than high. The blood sugar was 109 mgm. The nonprotein nitrogen was 20.8 mgm. The blood sugar curve was fasting 105 mgm.; one hour after glucose 161 mgm.; two hours after glucose 109 mgm.; three hours after glucose 107 mgm. The patient vomited some during this test. The basal metabolism was —2 per cent. After ingestion of forty grams of galactose the urine for the first two-hour period showed no reduction. For the second two-hour period it showed .6 gram. When given thirty grams of galactose the first two-hour period showed .33 gram and the second two-hour period gave a positive qualitative test but not sufficient for a quantitative test.

While in the hospital the patient has had periods of fever with no apparent cause except that on one such occasion there was bronchitis together with a transient heart murmur. There have also been periods when she will have small, painful areas of capillary hemorrhage. There have been periods of bleeding from the vagina which at first were thought to be menstruation but later were regarded as hemorrhagic in character. She has had a tremendous appetite.

She has been placed on endocrin feeding to see if this would produce any effect. From May 30 to June 24, 1925, she was given ten grains of whole ovary three times a day with no apparent change in her condition. Since July 3, 1925, she has been fed whole pituitary ten grains three times a day. She has lost twenty pounds in weight. Otherwise no special change has been noticed. The blood sugar has shown a marked change and on October 13, the fasting blood sugar was 206. Four hours after taking 184 grams of glucose the blood sugar was 606 mgm. Sugar appeared in the urine at this time. On November 19, 1925, the fasting blood sugar was 167 mgm. The urine has continued to vary. At times sugar is present. At other times it is absent.

A blood examination done November 19, 1925, was as follows: hemoglobin, 80 per cent; red blood cells, 3,600,000; white blood cells, 6,200; differential count polymorphonuclear, 53 per cent; small lym-

phocytes, 36 per cent; large lymphocytes, 6 per cent; transitionales cells, 4 per cent; eosinophiles cells, 1 per cent. Smear was normal.

The loss of weight, the enormous appetite, the high blood sugar and occasional sugar in the urine would all suggest that the patient may be developing a true diabetes. Her condition, otherwise, seems to be on a definite endocrin basis in which the pituitary, the thyroid and the ovaries would seem to be involved. No special benefit, however, has followed the feeding of any of these three glands. The patient presents mainly the symptoms of an adiposis dolorosa. Vitaut gives four cardinal symptoms—swelling, pain or tenderness, asthenia and psychic symptoms all of which are present in this case. Dercum states that the psychic symptoms consist largely of irritability and a feeling that people are against the patient. These are the particular symptoms which have been shown by this patient. Dercum also mentions as other important symptoms the fact that the hearing is often impaired and that vasomotor symptoms, such as small ecchymosis, are frequent. Both of these symptoms are present in this case. Dercum likewise considers that adiposis dolorosa is an endocrin disorder and that four glands may be involved—the thyroid, the gonads, the pituitary and the adrenals.

Discussion: Dr. H. C. Solomon: Let me ask about the interpretation of tests for hypogonadism when the ovaries have been removed.

Dr. Bowman: One reason for doing that test was the fact that the report from the Massachusetts General Hospital was not perfectly clear. The operation was done thirty-five years ago, and the record of the case was illegible. It was regarded as an ovariotomy, and just about the time the ovaries were brought to the surface nobody could read what the rest of the record said. While in the hospital the patient has had some periods of bleeding from the vagina which at first was thought to be menstruation, but later we thought this was the same kind of hemorrhage she had been having under the skin.

A CASE OF UNSTABLE PERSONALITY WITH VIVID IMAGINATIVE AND DRAMATIZING POWERS

Clem C. Fry, M.D.

The case to be presented is that of a farmer boy, sixteen years of age, of Portuguese extraction, who was brought to the B. P. H. on account of running away from home on several occasions, and cleverly and falsely obtaining money from his father's friends since June, 1925.

While under observation here the boy shows, as a rule, quite normal behavior but gives an interesting account of what he claims to be actual experiences. He also goes through an occasional episode which lasts from a fraction of a minute to fifteen minutes. He tells many fanciful tales of conquest in which women play the leading rôle; of having intercourse to an excessive degree; of going to dances; of being engaged to the town clerk's daughter; of being in partnership with his father and of receiving plenty of money to spend. The whole account pictures the patient as the hero. The boy's father

states this to be false. The patient tells of other experiences in which his dead mother has appeared to him and advised him. He states that because of his immoral living the devil now appears in place of his mother and his mother comes very rarely. Last May a cow spoke to him saying: "You must leave this barn and never come back here again. You will do well. You are in danger here. Wealth and happiness await you elsewhere." A goat has also spoken to him on several occasions.

The running away is motivated in two ways. He states that often he is unable to control it because something comes over him and he must go. For example the cow commands him to leave. He also states that he desires to go out into the world to seek adventure and fortune or to be adopted by some wealthy person. As to the cow commanding him to run away we have to think of a retrospective falsification or a very vivid fantasy at the time. The stealing is to secure money to use on his escapades. He obtains the money by telling tales of his father being in need of money. He does this very cleverly so that his victims are completely taken in.

We are dealing with a very imaginative youth in a rather drab environment who gives us other evidence of his special imaginative powers. This evidence consists in episodes which are always dramatic but variable in their content and duration and which may be gradual or sudden in onset, and which may come on through suggestion. The usual type of episode seen is where the patient wanders about the ward in a dazed state bumping into everything about him. Again, he may assume a very dramatic attitude often with an appearance of fear and distress. Tears come to his eyes, he crouches and his face and hands tremble. The general appearance is one of a person warding off some horrible danger. After these attacks he tells of having vividly seen the devil beckoning to him. At other times he seems to be passing through some pleasurable experience and he laughs. He goes through a pantomime of driving a car or playing a baseball game. After these affairs he may or may not be sleepy, he may or may not complain of frontal or temporal headache, and he often drinks large quantities of water.

We see a boy physically handicapped by a deformity of the legs and one arm due to an anterior poliomyelitis which occurred at six months of age. In addition, this boy has an unstable personality, an unusual capacity for vivid imagination and ability to dramatize the same, and thus indulge to excess in romance. He is very suggestible as shown in his reaction to fairy tales, and the attacks which come on if he is talked to about certain things. He shows a tendency to build up fanciful tales of his conquests. Perhaps all this is according to Adler's conception of organ inferiority in which the individual compensates for physical inferiority by living out a life of phantasy instead of reality. Upon the sexual side is long-continued masturbation, homosexual practices, and possible sexual experiences with animals. All this is in an individual with a poor intellectual endowment. Hysteria might be thought of in this case since the patient is very suggestible, and perhaps not unlike those children who were

responsible for the days of witchcraft at Salem in 1692. If he is allowed to go on may we not find this patient developing a purely scizophrenic picture?

Discussions: Dr. W. Healy: I should like to know something more about the patient's background.

Dr. Frye: His intelligence seems to be one factor that was noted. In the Stanford examination he was exceptionally good in reasoning power but failed on practically everything else. His environment is poor; he has little chance for recreation.

Dr. Healy: Does he act this way whenever he has an audience?

Dr. Frye: If I suggest a girl or the devil, I can usually get him to go into one of these states with or without an audience, but he prefers to have someone around.

Dr. Healy: Does he remember what has taken place?

Dr. Frye: At first he could remember everything that went on, but now he says, in the most severe attacks which last ten or fifteen minutes, his mind has actually been a blank at all times, but at times he tells us what has gone on even when he says his mind has been a blank.

Current Literature

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Lévy-Franckel & Juster. Pathogenesis of Trophic Skin Lesions. [Presse Méd., July 28, 1923.]

This paper calls attention to the reciprocally acting influences of the endocrino-vegetative reflexes as influencing changes in the hair, nails, and the skin proper, pigmentation and horny degeneration. The skin is a microcosm of the functional disturbances of the different endocrine glands and their vegetative nerve connections.

Vallery-Radot. Desensitization by Cutaneous Reactions. [Bull. d. l. Soc. Méd. d. Hôp., Mar. 23, 1923; J. A. M. A.]

Vallery-Radot says that the cutaneous method of desensitization described by him and Haguenau, in 1921, is much simpler than subcutaneous injection of progressively increasing doses of the specific substance. He refers to a patient, subject to severe asthmatic attacks in the presence of emanations from horses, whom he subjected to cutaneous reactions from horsehair, nearly daily for two months, with success. His experiments show that it is thus possible to desensitize an anaphylactic subject through the repeated application to the skin of minute quantities of the protein to which he is susceptible. The method has been tried with success by others, but it had no effect on one patient sensitive to ipecac, even though he experienced the blood shock with the cutaneous ipecac reaction.

Fox, H. Roentgen Ray Versus Vaccines in the Treatment of Acne. [J. A. M. A., Oct. 27, 1923.]

The roentgen ray has now been used for many years in the treatment of acne. While its therapeutic value in this disease was early recognized, its dangers were also soon apparent. Good results were possible to obtain even with the old unmeasured technic, when used by men of special skill. Since the introduction of accurate methods of measurement, Fox says the technic has been greatly simplified. In the hands of a careful operator, using modern apparatus and measured dosage, the roentgen ray is now as safe as it is efficient. The results in the treatment of acne are more permanent than with any other therapeutic agent. The introduction of vaccine therapy in acne occasioned considerable enthusiasm for a period of years. After an extensive trial of this method, the majority of dermatologists have either wholly or partly given up its use.

Good results have undoubtedly been obtained by a few investigators after patient efforts with special technic. In the hands of the majority, the results in general have been unsatisfactory. The weight of opinion is that mixed vaccines (of both acne bacillus and staphylococcus) are of more value than those of acne bacillus alone. Stock and autogenous vaccines are considered by the majority to be of equal efficiency. Whatever value these vaccines may possess is restricted to their use in selected cases, chiefly of the pustular type, or as an adjuvant to other methods of treatment. The action of vaccines is slow, and improvement is often temporary. In the treatment of acne vulgaris, the roentgen ray is far superior to vaccines.

Gartje, E. Hypersusceptibility in Constitutional Eczema of Infants. [Monatsschrift für Kinderheilkunde, April, 1923.]

This paper maintains that there is a group of children who are affected with constitutional eczema and who show a hypersusceptibility of the skin toward fats, which is expressed in the eczema. These children are characterized by thinness, a dry eczema, and are usually free from other exudative phenomena. Fatty food or the administration of fat aggravates the eczema, and the exclusion of fat causes it to recede or to disappear entirely. Cod liver oil acts in the same manner in this respect. The author believes in the theory that milk fat is the etiological factor responsible in these cases and would therefore exclude all fat from the diet, with the reservation that this applies only to the group of constitutional eczema. Inasmuch as injections of butter and oil seem to lessen the hypersusceptibility of the skin, a certain therapeutic significance may be attached to the intracutaneous injections of solutions of fat in obstinate cases.

Lomholt, S. Treatment of Eczema and Neuro-dermatitis with Finsen Light. [Uges. f. Laeg., May 17, 1923; B. M. J.]

S. Lomholt reports very favorably on the results obtained at the Finsen Institute in Copenhagen from the treatment of certain nontuberculous skin diseases with concentrated carbon arc light. The diseases under consideration fall into four main groups: (1) Chronic neurodermatitis; (2) chronic, dry, to some extent desquamating, eczema; (3) chronic weeping eczema; and (4) acute eczema. The author's first series included 42 patients treated between September, 1921, and April, 1922. His second series consisted of 37 patients treated since June, 1922. The results in this second series were even better than in the first. In 6 cases the treatment was not yet completed, and in 3 it effected no improvement. Of the remaining 28 patients, 8 showed marked improvement and 20 were completely or practically cured. These good results were the more noteworthy because in the overwhelming majority of the cases the disease was chronic and had proved refractory to other methods. The improvement effected was both objective and subjective.

and, in addition to the disappearance of such symptoms as itching, there were demonstrable changes in the skin, which became soft and flexible and ceased to desquamate. The intense hyperemia provoked by this treatment lasted a considerable time, and was often associated with pigmentation, which was most common in those areas usually covered by the clothing. Compared with X-ray treatment, which devitalizes the skin and is apt to cause atrophy and ulceration, Finsen light, says the author, is quite safe. The results it effects may not perhaps be permanent, but it seems to increase and stimulate the vitality of the skin owing to the hyperemia it induces. On the other hand, when eczematous skin has been treated with the X-rays without permanent results, it is henceforth remarkably refractory to other treatment, probably because the vitality of the skin has been reduced by the X-rays. The efficacy of carbon arc light is apparently due to the fact that it penetrates more deeply into the skin than does the light from the mercury lamp.

Duke, W. W. Urticaria Caused by Light. [J. Amer. Med. Asso., LXXX, 1835.]

Duke reports the case of a woman, aged forty-three, who became so sensitive to light that exposure of the skin for two and one-half minutes to direct winter sunlight invariably caused erythema and urticaria over the entire area exposed. The reaction was caused only by the blue-violet rays. Constitutional symptoms were felt on two occasions when a large area of skin was exposed to light. A considerable degree of tolerance was developed by repeated exposure of small areas of the skin to light. Tolerance thus acquired, however, was lost after a short time. Efforts to produce urticaria in this patient by agents other than direct exposure to light failed except in two instances, viz., the intracutaneous injection of sera which had been treated with hematoporphyrin and then exposed to light, and the intracutaneous injection of hematoporphyrin followed by the exposure of the injected area to diffused light for a short time.

Meiné, F. Idiosyncrasy to Mercury. [Brit. Med. Jl., June 30, 1923; J. A. M. A.]

Meiné cites the case of a young woman whose eyelids were edematous, with small pearlish blebs on the skin surface; there was a good deal of injection of the conjunctivae, with similar blebs on them. She complained of excessive watering of the eyes, blurred vision and photophobia. On the posterior surface of the auricle and skin adjoining were erythematous pearl-like blebs. All down one side of the neck over the distribution of the fibers of the trapezius was a distinctly shotty erythema. The case appeared a puzzle until Meiné went into the question of occupation. The patient had lately been engaged as a dental nurse; she had been clearing up amalgam fillings, and had touched some globules of mercury. Evidently she had rubbed her eye with the finely divided

metallic mercury and set up slight mercurial poisoning. She had some slight watering of the mouth, and the parotid was very tender. Evidently the case was one of special idiosyncrasy to mercury.

Lermoyez & Aleijouanine. Urticaria and Hemiplegia. [Presse Méd, Jan. 27, 1923.]

This carefully observed case of a woman, aged sixty-two, who had an acute right hemiplegia with pronounced sensory disturbances. Following a meal of fish three months later she had a pronounced urticaria on the same side. Pinching the skin at the back of the neck induced the pilomotor reflex only on the sound side, while sweating was profuse only on the paralyzed side, and the systolic blood pressure was lower on this side. Test injection of horse serum induced the appearance of the urticaria on several occasions, but it was always restricted to the paralyzed side. All of the tests indicated disturbances of the higher vegetative centers which evidently had been involved in the hemiplegic focus.

Lewis, T., and **Grant, R. T.** Vascular Reactions of the Skin to Injury. Part II. The Liberation of a Histamine-like Substance in Injured Skin; the Underlying Cause of Factitious Urticaria and of Wheals Produced by Burning; and Observations upon the Nervous Control of Certain Skin Reactions. [Heart, 1924, II, 209–65; Med. Sc.]

The present studies start from the standpoint previously developed, namely that the vascular changes which occur on stroking the skin in patients suffering from urticaria factitia are identical with those called forth in normal skins when these are subjected to stronger or repeated stimuli of the same kind. It is known that a chemical stimulus may call forth reactions resembling those resulting from mechanical injury, and the report focuses itself largely upon the similarities of the skin's reaction to stroking and to the introduction of histamine and upon the meaning of these similarities. The observations have also been extended to other forms of damage, more particularly to the response to scalding heat and also to a lesser extent to punctures and scratches. Particular attention has been paid to the influence of the nerve-supply to the skin on these reactions. From the comparison of the effects of the application of these mechanical, chemical, or thermal stimuli to the skin, the general conclusion is reached that they all give rise to the same vascular reaction. It is a complex reaction and is composed of the three following constituents: (a) A local dilatation of the minute skin vessels, which, since it occurs when the circulation is at a standstill, is a primary dilatation of these vessels. It is not dependent upon simultaneous dilatation of the arterioles and is also independent of the nervous system, occurring equally well in denervated skin areas. (b) A surrounding flush due to widespread dilatation of the skin arterioles. This flush is dependent on a local nervous reflex, being unaffected by fresh nerve section but abolished by

nerve degeneration or by local anesthesia. (c) An output of fluid into the tissues to constitute a wheal, due to an independent and local change in the permeability of the vessel walls, which, like the local vasodilatation, is uncontrolled by the nervous system. The fact that the reaction is the same for the different classes of stimuli suggests an underlying common factor of causation, and it is believed that this factor is tissue damage, which acts by liberating a substance or substances which set the complex mechanism in motion. The evidence for this is chiefly drawn from a further comparison of the histamine and stroke reaction. By experiments on the effects of occluding of the circulation to a limb, and on the variations produced by heat and cold in these circumstances, strong evidence is brought forward to show that each of the three constituents of the complex reaction to stroking results from the liberation of a chemical substance in the skin, this substance having a histamine-like action on the blood-vessels and nerves. It is shown also that the increased permeability of the skin vessels consequent upon a histamine or mechanical stimulus locally applied is shortly followed by a peculiar condition of partial or complete refractoriness to further stimulation of the same kinds; as this condition of refractoriness becomes established, increased permeability disappears. The meaning of this phenomenon is discussed at length. The observations have resulted in the formulation of a more general law, namely that there exists in the skin a single and organized mechanism of defense against injuries of all kinds and that the agent setting this mechanism in motion is a chemical agent derived from the tissues. Lastly, the observations are discussed and brought into perspective with shock arising from histamine, from severe mechanical injuries, and from severe burns, as these have been described by previous workers.

Brancati, R. On the Pathogenesis of Death from Scalding. [Haematologica, IV, 206; Med. Sc.]

Experiments were made chiefly on guinea-pigs, the skin of which was scalded once or repeatedly up to four times after shaving. Some of the animals were killed at fixed intervals; others were allowed to die. Independently of the extension and number of scaldings, death took place at various periods of time from a few hours up to 22 days. Besides a more or less intense congestion of most organs, minute whitish nodules were observed in the liver, spleen, omentum, and mesentery of all the animals. The nodules consisted of a variable quantity of granular material surrounded by a certain number of cells of the clasmatocytic type. Only in those animals which had survived for longer periods, elongated connective tissue cells were, in addition, observed. In order to find out with greater precision what could have been the cause of death, an extract of the liver of the scalded animals was prepared and inoculated either subcutaneously or intraperitoneally in other animals. When the dose was

sufficiently large or the number of injections sufficiently great, the guinea-pigs died with symptoms and lesions similar to those shown by the scalded ones. The symptoms having a certain resemblance to anaphylactic shock, other batches of guinea-pigs were first sensitized with small subcutaneous injections of liver extract from scalded animals and then inoculated intravenously with a somewhat larger dose of the same extract. In all cases a typical anaphylactic shock was observed either immediately after the intravenous inoculation or some hours afterwards up to a day. Anaphylaxis is his hypothesis as to the cause of death.

Vallery-Radot, Pasteur, et al. Dermographism. [Presse Méd., June 14, 1924.]

Pasteur Vallery-Radot and his co-workers recall that two symptoms exist in dermographism, an erythema and edema. While the erythema is produced by a hyperirritability of the vasomotor nerves, the edema depends on an external cause and on the circulation. The external factor is the slight stroke on the skin, which causes a change in the capillary walls and effusion of the plasma. Dermographism occurs when the circulation is normal; in cases with a disturbed local circulation this phenomenon is delayed, diminished or prevented. Thus the presence of three elements is necessary for dermographism: vasomotor change of sympathetic origin, trauma and a normal local circulation.

Polák, E. Sympathetic and Skin Sensitiveness. [Cas. lek. cesdzch., June 14, 1924. J. A. M. A.]

Polák found in sympathectomized frogs a distinct increase in sensitiveness of the skin for tactile and chemical stimuli. The change was pronounced on the operated side and persisted to the death of the frog (up to forty-five days). It was slighter and transitory on the other side. He obtained similar results on rabbits, testing the corneal sensibility with Frey's hair method.

2. ENDOCRINOPATHIES.

Concepcion, I. Incidence of Diabetes Mellitus Among Filipinos. [Philippine Islands Medical Association Journal, II, No. 2, p. 57; J. A. M. A.]

Concepcion shows that the mortality of diabetes mellitus in the city of Manila has gradually been increasing from year to year, especially within the last few years. This increase is only apparent, due to a greater accuracy of vital statistics. There is no reason to believe that increased consumption of sugar is one of the main factors responsible for the greater frequency of diabetes in the last few years. At least this supposition will not hold true in the city of Manila as there is no corresponding increase in mortality from diabetes due to the increased

consumption of sugar per capita. The incidence of diabetes in the Philippines is very much less than in other countries, including Japan. The disease is most frequent between the ages of 40 and 50 among Filipinos. This is also true among Japanese and Chinese. Among Europeans it occurs most commonly between 50 and 70. The slight difference may be explained by the early maturity of Orientals as compared with Europeans. Diabetes mellitus as it occurs among Filipinos is of a milder type than among Europeans and Americans. The mortality of those suffering from it is very low and only a small percentage die of diabetic coma. The low incidence of diabetes mellitus among Filipinos and other Orientals may be explained as due either to greater power of assimilation for sugar among these people compared with Europeans and Americans, or to the fact that they are less exposed to continuous nervous strain on account of their peculiar modes of living. It may also be due to some peculiar racial tendency or characteristic. This point is of interest, as in the Philippines the diet is largely carbohydrate; for that reason diabetes should be more frequent here than in other countries which, however, was found not to be the case.

Conroy, M. J. Changes in the Islands of Langerhans in Diabetes Mellitus. [Jl. of Metab. Research, Sept., 1922.]

The results of a study of quantitative and qualitative changes in the islands of Langerhans are here given. A thorough study was made of all parts of the pancreas in 12 cases of diabetes and 12 controls of similar age, and a less thorough study of 95 routine autopsies of nondiabetics. Both quantitative and qualitative differences were found in the diabetic and nondiabetic groups. In the diabetic group an enumeration of the islands in sections from serial blocks of tissue through the entire organ showed a marked reduction in the amount of insular tissue. The average number of islands per cross-section was 73.6, as compared with 183.6 in the controls. In only one nondiabetic case was the count as low as the highest figure in the diabetic group. Every case of diabetes showed more or less qualitative changes in the islands, chiefly hyalinization and fibrosis, the latter lesion being quite widespread in some cases. Hyalinization of the islands was seen in only two cases of the nondiabetic group, and in these it was not so pronounced as in the majority of the diabetic cases. Definite hydropic degeneration of the islands was observed in only one of the diabetic cases and in none of the controls, but it is possible that the tissue in most cases was not fixed sufficiently early after death for a satisfactory study of this lesion. Changes involving the acinar tissue, particularly interacinar and interlobular fibrosis, were seen in both series, but were more marked in the diabetic cases. From this study the author concludes that both quantitative and qualitative changes are operative in leading to a functional insufficiency of the insular tissue as manifested by clinical diabetes.

McCann, W. S., and Hannon, R. R. Studies of Diabetes Mellitus. I. Respiratory Exchange Following the Ingestion of Glucose, Glycerol, Calcium Hexose Phosphate, and Calcium Glycerophosphate. [The Johns Hopkins Hospital Bulletin, XXXIV, p. 73.]

The respiratory exchange was studied by means of a Tissot apparatus at short intervals for two hours following the ingestion of glucose, glycerol, and the phosphoric esters of each. The subject of the experiments was to determine whether carbohydrates or polyhydric alcohols were more readily oxidized when ingested as such or when ingested in the form of esters of phosphoric acid. As regards the oxidation of glucose diabetic subjects were found to be of two types. In one type of severe intractable diabetes the respiratory quotients rose at a normal rate following ingestion of glucose. In the other type the respiratory quotients were diminished for an abnormal length of time after ingestion of glucose. When calcium hexose phosphate was ingested by this latter type the respiratory quotients rose, no depression of R.Q. being noted. When the effects of glucose and of glycerol were compared in the same subjects the behavior of respiratory quotients was the same with each substance. There was no clear cut evidence that glycerophosphate was more readily oxidized than glycerol. The difference in behavior of the respiratory exchange of diabetic patients when glucose was ingested lends support to the belief that there may be different types of diabetes mellitus depending on different mechanisms. [Author's abstract.]

Allen, F. M. The Pathology of Diabetes. 6. Pancreatitis in the Aetiology of Experimental Diabetes. 7. Microscopic Studies of the Pancreas in Clinical Diabetes. 9. Literature and Discussion. [J. Metabol. Res., 1, 165, 193, 251; Med. Sc.]

The difference between human diabetes and that produced experimentally in the dog is due, in large part, to the fact that in the diabetic pancreas there is always evidence of a long-standing previous damage, and the visible changes do not give an accurate measure, in a diabetogenic sense, of the real abnormalities of the organ. The consequences of acute inflammation are rarely progressive in dogs, and the resulting diabetes is subject to dietary control like that following simple partial pancreatectomy. Whatever acute injuries the islands sustain, their subsequent preservation or destruction depends upon the diet and the occurrence or nonoccurrence of hydropic degeneration. In the seventh paper of this series it is shown that the pancreas in every case of diabetes has borne marks of infectious or toxic damage. Hydropic degeneration is demonstrated in the human pancreas whenever diabetic symptoms have been sufficiently intense and prolonged. It is ordinarily missed in the mildest cases and is to be interpreted as an anatomical breakdown of the island cells by overstimulation of their internal secretory functions on excessive diet. The pathological findings give the impression that " from the stand-

point of primary etiology the diabetic pancreas in most cases represents a burnt-out conflagration, and the chief or sole cause of aggravation of the condition lies in hydropic degeneration of islands." This interpretation alters the former conception of diabetes as an inherently progressive disease, and affords grounds for regarding the average case as the consequences of damage of a vital organ which is in danger of further injury chiefly or solely from functional overstrain. Clinical evidence to date corroborates this view by showing that by sufficient dietary control the downward progress of most cases of diabetes is either halted or almost indefinitely delayed. In the ninth paper a *résumé* of Allen's work and a critical survey of the literature is given.

Banting, F. G., et al. A Pancreatic Hormone in Diabetes. [Am. Jl. Phys., 59, 479; Jl. Lab. & Cl. Med., 7, 251; Can. M. J., 12, 141; Ed. J. A. M. A.]

Less than half a century has elapsed since the pregnant discovery, by von Mering and Minkowski in 1889, of the highly important part which the pancreatic gland plays in the control of carbohydrate metabolism in the body. Their classic experiments demonstrated that if the pancreas is completely extirpated, hyperglycemia, glycosuria, and the complete loss of the power to burn glucose or other carbohydrates ensue. There are many reasons for believing that lesions of the pancreas in man lead to disturbances in the metabolism of sugar such as manifest themselves clearly in the diabetic. Whether the determining lesions are confined to the islets of Langerhans in the pancreas, as some pathologic histologists assert, or whether other groups of pancreatic cells may be concerned in the genesis of diabetes, cannot be definitely stated at present. It has become customary to postulate an internal secretion for the islets, and to make this responsible for the undoubted function of the pancreas in sugar metabolism. However, many cases of diabetes fail to reveal recognized defects in either the islets or the acinary cells, so that final pronouncements are unwarranted.

The general opinion is that sugar continues to be formed in the diabetic, from such precursors as are available, at the usual rate and to the usual extent. The defect in the metabolism relates to the subsequent destruction of the sugar. The disproportion between formation or mobilization of carbohydrate and its utilization in the organism is exemplified in the increased content of sugar circulating in the blood. Hyperglycemia is the most characteristic chemical symptom of diabetes. As might be expected, there have been numerous attempts—surely many, many more than the published literature would disclose—to supply the missing "regulator" of sugar combustion; and attention has naturally been centered on the pancreas in this connection. The most significant results thus far recorded have recently been secured in the Department of Physiology at the University of Toronto under the leadership of J. J. R. Macleod. These investigators have prepared products from the

pancreas by extraction with alcohol which apparently enable the diabetic animal and man to metabolize sugar better. The evidence lies primarily in the reduction of the hyperglycemia of such patients after administration of the suitable pancreatic extracts.

The latest experiments by the Toronto workers bring the significant evidence that injections of the substance isolated lower the content of sugar in the blood of normal animals as well as those rendered diabetic. Its importance lies in the implication that the action of the active component or pancreatic hormone is a fundamental one in the control of the blood sugar. It is not difficult experimentally to effect a lowering of the blood sugar in a few hours, through high dosage, to a point at which serious symptoms attending the hypoglycemia ensue. These can in turn be combated by administration of glucose, a possibility also demonstrated for the hypoglycemia consequent on extirpation of the liver.

The pancreatic factor apparently does not unfold its characteristic effect in the blood stream itself, for it does not influence the glycolytic power of blood in vitro or the rate of postmortem glycogenolysis in the liver. According to the findings of Hepburn and Latchford at Toronto, on the other hand, the influence of the new extract is exerted in the active tissues themselves. At any rate, it has the ability to increase the consumption of sugar in mammalian muscle, as demonstrated by the rate at which reducing substance disappears from nutrient fluid that has been repeatedly perfused through the surviving heart. The investigators are wisely withholding the product from general use while it is undergoing thorough trial by specially selected experts in metabolic diseases and in properly controlled hospitals.

The history of medicine warns us against undue haste in the acceptance of "specifics" applicable to bodily functions. Nevertheless, scientific progress should always challenge our enthusiasm, and may be excused if it awakens the hopes that spring eternal in the mind of man.

Falta, W. Diabetic Edema. [Wien. Arch. f. inn. Med., Jan., 1923.]

W. Falta records a number of observations respecting the edema which occasionally occurs in severe diabetes mellitus, independently of kidney disease. This edema is especially liable to occur when sodium bicarbonate is taken in large doses, but is checked by giving potassium bicarbonate or even potassium chloride. When large doses of alkalis are given in diabetes on account of acidosis a mixture of sodium bicarbonate and potassium bicarbonate is advisable in order to avoid the occurrence of edema. When edema has occurred under the influence of sodium bicarbonate in large doses it has been attributed to retention of chlorides. But the author records a series of careful observations on an interesting case in which, on a diet containing much salt, large doses of sodium bicarbonate were followed by great edema, which disappeared when the sodium bicarbonate was replaced by potassium bicarbonate. On a diet containing very little salt (so-called salt-free) the administra-

tion of large quantities of sodium chloride produced marked edema, but this disappeared when the sodium chloride was replaced by potassium chloride; also on this same salt-free diet large doses of sodium bicarbonate caused marked edema, which disappeared when the sodium bicarbonate was replaced by potassium bicarbonate. The relation of edema to acidosis is discussed. Edema can occur unassociated with acidosis.

Nobécourt. Diabetes in Children. [Médecine, Aug., III, No. 11.]

Alimentary lactosuria of infants with gastro-intestinal derangement may be confused with glycosuria The mild form of diabetes in children can generally be cured by restricting carbohydrate intake, but sometimes it persists unmodified and without aggravation up to adult life. The child develops apparently normally. Sometimes the mild form changes to the grave form or the diabetes may be grave from the start, with a tendency to denutrition or to hypotrophy or both. The prognosis should always be reserved; the effects of treatment will generally tell the story.

Wallis, R. L. M. New Pancreas Preparation in Treatment of Diabetes Mellitus. [Lancet, Dec. 2, 1922, II, No. 5179.]

This author reports on a new preparation of the pancreas obtained by alcoholic extraction in vacuo. This extract he believes, when taken by stomach, is capable of reducing the blood sugar in certain cases of diabetes mellitus. This reduction of the blood sugar makes the patient more tolerant. The extract is useful as an adjuvant, particularly in those cases of diabetes mellitus with complications—*e.g.*, threatened coma, gangrene, etc. The treatment is determined by the general condition of the patient, the blood sugar, and tolerance to carbohydrate intake.

Marsh, P. L. Complications of Diabetes Mellitus. [Michigan State Medical Society Journal, XII, No. 6, p. 238.]

A general discussion of the more important complications of diabetes. Some of these complications are of more moment than others because of their effect upon the carbohydrate complex, others because the diabetes has a direct bearing upon the complicating disorder—thus a diabetes may make a simple infection a serious or fatal disorder. Again others are distressing to the patient and may be fatal.

Macleod, J. J. R. Source of Insulin. [Jl. of Met. Research, II, No. 2; J. A. M. A.]

As a result of the improved histologic technic introduced by Lane and Bensley and of the recent demonstration by Banting, Best, Collip, Macleod and Noble that an alcoholic extract of mammalian pancreas—known as insulin—profoundly lowers the percentage of blood sugar in normal rabbits, Macleod says, the whole question as to the significance of the islet tissue, and particularly whether it is the source of insulin, is reopened for investigation. There are two aspects to the problem, the one being to compare by modern histologic methods the exact cytologic

structure of the islets in the mammalian and the *Elasmobranch* pancreas with that of the principal islets found by Rennie in the *Teleostei,* and the other, to study the effect of extracts prepared from these sources on the percentage of blood sugar in normal rabbits. In general, the plan of investigation has been to observe from time to time the amount of blood sugar in normal rabbits injected with extracts prepared from the following sources: (1) the pancreas of representative *Elasmobranchii* [*Squalus* (dog fish) and *Raja* (skate)]; (2) the principal islets of representative *Teleostei* [*Myoxocephalus* (sculpin) and *Lophius* (angler fish)], and (3) the zymogenous (acinar) pancreatic tissue, as free as possible from islets, in the same and certain other *Teleostei.* Potent insulin preparations were readily made from the pancreas of the cartilaginous fishes—the dog fish (*Squalus acanthias*) and the skate (*Raja*). Still more so was this the case with the principal islets of Rennie, which are found in many of bony fishes, the angler (*Lophius*) and the sculpin (*Myoxocephalus*). Since these are readily available fishes, they may serve as a practical source of insulin. No insulin could be prepared from the pancreatic tissue proper (zymogenous or acinar) of the representative bony fishes (*Lophius myoxocephalus* and *Zoarces*). Although the anatomic relationships of these tissues are still somewhat obscure, these results, in Macleod's opinion, afford strong direct evidence for the hypothesis that insulin, as its name implies, is derived from the insular and not the zymogenous tissue of the pancreas.

II. SENSORI-MOTOR NEUROLOGY.

4. MIDBRAIN, CEREBELLUM.

Anton, G. Motor Functions and Disturbances of Development of the Cerebellum. [Ztschr. f. Nervhlk., LXXVII, Nos. 1–6.]

Anton reports three cases of cerebellar defect in which compensation had taken place through the cortical tracts, the pyramidal tracts and the lemniscus tract.

Tilney, F. Genesis of Cerebellar Functions. [Am. Arch. of Neur. & Psych., Vol. VII, No. 2.]

Most of the work upon the cerebellum in the past has been based upon animal experimentation and clinicopathologic observation in man. The study of this organ at a stage in its development when it has reached its highest complexity necessarily imposes all of the difficulties of approaching the problem in its most involved rather than its simplest form.

The method of approach in the present investigation includes comparative morphologic studies beginning with the more primitive forms of vertebrate organization, such as cyclostomes, sharks and rays, ganoid and teleost fish; with later reference to reptiles, amphibians, birds and mammals. The embryogenetic characters of the cerebellum were studied

in all these forms with the idea of revealing a common ground-plan in the structure of the organ, together with an analysis of the motor reactions of the animal in the light of its cerebellar organization. No exact homologue of the vertebrate cerebellum is known in the invertebrate phylum. The problem of the first appearance of this organ is interwoven into the whole question of the invertebrovertebrate transition. The cerebellum bulbare and the cerebellum jugale, the most primitive components of the cerebellum (archeparencephalon), took origin in the medulla oblongata. They are the sole representatives of cerebellar organization in the cyclostomes. Their homologues in the human brain are to be found in the vestibular nuclei of the medulla and the inferior cerebellar vermis. In man the greater portion of the cerebellum bulbare has become incorporated in the inferior vermis. Its bulbar remnants are seen in the vestibular nuclei. Correlating life habits with morphology, it is seen that the lamprey (cyclostome), during the entire period of larval life, while the animal is lying quiescent in the mud, possesses a cerebellar structure consisting of two unconnected lateral ridges, constituting the cerebellum bulbare. As it approaches metamorphosis, however, a strand of nerve cells begins to migrate across the roof plate. By the time the animal becomes a free-swimming organism, it has acquired a cerebellum jugale. The next component to appear, the cerebellum mediale (paleoparencephalon), took origin from the roof of the cerebellum as a single unpaired evagination. It developed as the principal addition to the archeparencephalon in all true fish, amphibians, reptiles and birds. Its homologue in the human brain is to be found in the superior cerebellar vermis. The cerebellum mediale was evolved in response to the coördination needs arising out of an increased complexity of motion. The first appearance of this organ was in the shark and the dogfish, animals which possess great speed in swimming and great capabilities of pursuit and attack.

Selling, Laurence, and Kistner, Frank B. The Labyrinthine Tests in Cerebellar Diagnosis. [J. A. M. A., Oct. 6, 1923.]

As illustrating the general subject of the relation of the labyrinthine tests to cerebellar diagnosis, Laurence Selling and Frank B. Kistner, Portland, Ore., report four cases: (1) cerebellar tumor, with typical responses; (2) frontal lobe tumor, with normal cerebellar responses; (3) cerebellar tumor, with normal cerebellar responses, and (4) cerebellopontile angle tumor. The general picture to be expected from labyrinthine tests is as follows: *A.* Supratentorial tumors: (1) exaggeration of responses from brain stem (nystagmus) or cerebellum (past pointing), or both, or (2) diminished responses from the brain stem (impaired or perverted nystagmus), especially from the verticals; (3) presence of all responses from the cerebellum; (4) diminution of certain of these cerebellar responses, especially of outward past pointing. This may lead to the phenomenon of crossed past pointing, either spontaneous or following stimulation.

B. Cerebellar tumors: (1) spontaneous past pointing of one arm in one direction, with loss of reactive past pointing in the opposite direction, or loss of reactive past pointing of one arm in one direction, without spontaneous fault; (2) pressure symptoms in the brain stem. Lost, impaired or perverted responses, especially from the verticals, less often from the horizontals as well. *C.* Cerebellopontile angle tumor: (1) loss of responses (or gross impairment) from the cochlear and vestibular nerve on the affected side; (2) pressure symptoms on the brain stem. Lost, impaired or perverted responses, especially from the verticals, less often from the horizontals; (3) pressure symptoms on the cerebellum (homologous hemisphere) with impairment of past pointing in the homolateral arm, but retention of the reactive past pointing. These syndromes are not pathognomonic signs. In a few instances, it is possible to make a localizing diagnosis from them alone, but for the most part they are not specific.

Nishikawa, Y. Tumors of the Ponto-cerebellar Angle. [Arb. a. d. Neurol. Inst. Wien., XXIV (H. 1), 15. Med. Sc.]

In four cases of tumor of the pontocerebellar angle, the author noticed a considerable number of nerve-cells in the white substance of the cerebral cortex. On the cerebral cortex of a fifth case he found some slightly prominent nodules which consisted of spindle-shaped cells mixed with some nerve-fibers, glia-cells, and a few nerve-cells; the blood-vessels of these nodules showed signs of hyaline degeneration and were continuous with similar blood-vessels of the pia mater. Finally, the author describes (a) a tumor of the pontocerebellar angle which contained, in its center, "placques" consisting of protoplasmic and fibrous neuroglia, and (b) a tumor of the same region consisting of nerve-cells simiar to those normally seen in spinal ganglia. These observations show that tumors of the pontocerebellar angle are frequently connected with various malformations of the central nervous system. [C. Da Fano.]

Marburg, O. Pontocerebellar Angle Studies. [Arb. a. d. Neur. Inst. Wien, 1922–24, 1. Med. Sc.]

The cisternae pontis lateralis and magna cerebellomedullaris, blood vessels and cranial nerve topographies are first described minutely. Between the olive and the corpus restiforme a small area is found (Ziehen's fossa paraolivaris lateralis) surrounded by various formations, one of the principal of which is Essick's corpus pontobulbare. In order to understand its importance, it is necessary to bear in mind that it arises from a strand of germinal cells which from the lateral margin of the fourth ventricle turns outwards and becomes situated between the mesial wall of the lateral recessus and the medulla oblongata. Not only the corpus pontobulbare but also the arcuate nucleus and nuclei pontis develop from this embryonic strand of cells, which does not entirely disappear afterwards,

but leaves behind some remains recognizable on the lateral edge of the medulla oblongata in the shape of small ridges. The presence of these epithelial remains explains how and why tumors are found with a certain frequency in the neighborhood of the area paraolivaris lateralis. The same can be said regarding the epithelial remains which Marburg has noticed on that portion of the flocculus which forms the anterior and lateral wall of the lateral recessus of the fourth ventricle. Also that small part of the plexus chorioideus which is found between the flocculus and mesial wall of the lateral recessus may give origin to new growths. At the end of his paper Marburg discusses some questions regarding the anatomy and development of the posterior portion of the cerebellum in man. [C. Da Fano.]

5. PES; INTERBRAIN; THALAMUS; STRIATUM.

Hunt, J. Ramsay. The Striocerebellar Tremor: A Study of the Nature and Localization of the Combined Form of Organic Tremor. [Am. Arch. Neur. & Psych., Vol. VIII, p. 664.]

All forms of tremor movement bear a certain fundamental resemblance to one another, although finer differences are distinguishable. Tremors are fine or coarse, rapid or slow, rhythmical or arrythmical. Many organic affections of the nervous system are associated with tremor, more especially those involving the cerebellum, the corpus striatum, and their connections with the brain stem. Among these, paralysis agitans, multiple sclerosis, pseudo-sclerosis, and progressive lenticular degenerations are especially deserving of mention because of the constancy and characteristic nature of the tremor and the localization of the lesions. In the organic group of tremors two distinct clinical types may be differentiated: one, the tremor of repose; the other, appearing only during the course of movement itself, the so-called "intention tremor." This study is a consideration of the relation of these two forms of tremor to the corpus striatum and the cerebellum and their occurrence as a combined form—the *striocerebellar tremor.*

Striatal Tremor.—The relation of tremor to the striatal mechanism is now an accepted fact of symptomatology.

In 1915 the author described as primary atrophy of the pallidal system a group of cases with characteristic pathologic lesions presenting the symptomatology of paralysis agitans. In one case of juvenile type, in which the disease had existed for twenty years, histologic examination was made of the central nervous system, with special reference to the corpus striatum, the cerebellum, and their connections with the brain stem. As a result of these studies he regarded juvenile paralysis agitans as a system disease, the essential lesion of which is atrophy of the large motor cells of the corpus striatum (pallidal system).

In this case the lesion was strictly limited to the essential motor system

of the corpus striatum. The tremor, therefore, may be regarded as representative of the striatal type of tremor. It was slow and rhythmical, with from four to six vibrations a second, and was increased by mental excitement and physical activity. It was present during rest and was therefore a tremor of repose. It was increased at the beginning of purposive movements, but was not of the intention tremor type, and ceased entirely toward the end of an intentional movement; and while the tremor was increased during movement, there was not the atactiform uncertainty and other cerebellar components of the true intention tremor.

The mechanism underlying the production of striatal tremor is still one of the mooted questions of pathologic physiology. He regards it as a release phenomenon resulting from loss of striatal control and the expression of spontaneous activity in certain infrastriatal centers of the extrapyramidal system.

Relation of Striatal Tremor to the Kinetic System.—The writer has already presented at some length his views on the duality of function of the motor system. According to this conception, the efferent nervous system, both cerebrospinal and vegetative, consists of two components which are anatomically and physiologically distinct. One component is the kinetic system, which controls the movement proper; the other is the static system, which regulates the postural function of the contractile mechanism. The essential function of the kinetic system and the fibrillar structure of the muscle fiber is movement. The essential function of the static system and the sarcoplasmic structure of muscle is fixation or posture. These two systems of motility also play a rôle, he believes, in the production of organic tremor. The striatal tremor is related to the kinetic system and the cerebellar tremor to the static mechanism.

Relation of the Cerebellar Mechanism to Tremor (Cerebellar Tremor). —For many years tremor has been a well recognized, although inconstant, symptom of cerebellar disease. Cerebellar tremor is of the so-called intention type, resembling in character the tremor of multiple sclerosis. It is associated with other manifestations of a disorder of cerebellar function, for example, dysmetria and adiadokokinesis, and is only an extreme manifestation in the extremities of the underlying disorder of muscle synergy (asynergia) which is the fundamental symptom of a cerebellar disease. It has the character of a coarse ataxia, and in contradistinction to the tremor of paralysis agitans is always absent during rest. It is, therefore, never a tremor of repose. The tremor manifestation is coarse and arrhythmical, beginning with movement and increasing as the object is approached. A lesion of the cerebellar mechanism, therefore, disturbs the posture function of motility, the symptoms of which are dyssynergia, dysmetria, adiadokokinesis, and tremor, and in this sense the cerebellar tremor is primarily postural in its origin.

Striocerebellar Tremor.—This disorder of motility presents the characteristics of both a striatal and cerebellar tremor. There is the spon-

taneous rhythmical tremor characteristic of a striatal disorder in association with the intention tremor of cerebellar disease. Sometimes one component, sometimes the other, dominates the clinical picture, and there is also considerable variation in the degree and localization of the tremor disturbance. The striocerebellar tremor appears in the course of pseudosclerosis, more rarely in multiple sclerosis, and is not infrequently observed after inflammatory, vascular, and neoplastic lesions in the region of the midbrain. This is the meeting place of the efferent systems of the corpus striatum (pallidal system) and the cerebellum (dentate system), which converge and terminate in relation to the ganglionic masses of this region, of which the nucleus ruber is an especially important constituent. In the present state of our knowledge it would be unwise to limit our anatomic conceptions in the interpretation of organic tremor to the rubral connections of the corpus striatum and cerebellum. There are many other important nuclear structures in this region subserving a motor function, which Edinger has grouped under the general term, nucleus motorius tegmenti. The striatum and cerebellum both participate in the control of these subsidiary centers, so that for the present our conception should include both striatal and cerebellar components of this supraspinal mechanism. The author would, therefore, modify Edinger's generalization of a nucleus motorius tegmenti to include both a kinetic and static representation—the corpus striatum controlling the kinetic component and the cerebellum its static counterpart. In line with this conception he would regard the striocerebellar tremor as representing a disorder of both systems, the striatal component of tremor being referable to the kinetic system and the cerebellar to the static mechanism. In conclusion, therefore, the author postulates the existence of a combined form of organic tremor caused by involvement of separate neural mechanisms. We recognize combined forms of palsy, central and peripheral, pallidal and pyramidal, as well as combined forms of sensory disturbances due to simultaneous involvement of more than one system. In this category he would place the striocerebellar tremor. The author cites a number of personal observations and case reports from the literature illustrating this form of tremor. [Author's abstract.]

Siemerling, E., and Oloff, H. WESTPHAL-STRÜMPELL PSEUDOSCLEROSIS. [Kl. Woch., I, 1922, 1087; Med. Sc.]

The authors describe the case of a man of forty-three, employed in a brewery and in the habit of drinking daily four litres of beer and of smoking excessively, who, for six years before the examination now reported, had gradually developed tremor of the head and limbs. At the end of this period he presented a Parkinsonian facies and widespread tremor. This was minimal when he lay down, but became coarse and forceful during movement. Its rhythm was two per second. The musculature was markedly hypotonic, the tendon-jerks normal, the abdominal

reflexes absent, but the state of the plantar responses is not mentioned. Articulation was slow, but otherwise normal. Cerebration was normal. The Wassermann reaction was negative in blood and cerebrospinal fluid, but the latter showed an increased globulin content and seventeen lymphocytes to the cubic mm. The liver was definitely enlarged and its edge was palpable four fingers' breadth below the costal margin. The spleen was not enlarged. Hepatic tests gave no definite indication of defective liver function, beyond a very slight levulosuria. Examination of the eyes showed the presence of the characteristic green-brown pigment ring at the periphery of the cornea, and also a blue-gray haze on the surface of the lens resembling a sunflower in outline. This was visible only in oblique illumination. The authors point out that the lens condition exactly accords with that described some years ago by Purtscher as indicating the presence of minute fragments of copper in the eye in cases of perforating injury, and occurring apart from the presence of copper in the lens itself. Since this haze differed from all other forms of lenticular opacity in being invisible by transmitted light—that is, on ophthalmoscopic examination—Purtscher spoke of it as a "Scheinkatarakt," or "apparent cataract." The authors regard this new observation as tending to confirm the toxic-infective origin of the pseudosclerosis-progressive lenticular degeneration group of cases, to which they believe their case to belongs. They accept the view originally formulated by Kinnier Wilson, and erroneously attributed by them to German writers, that a poison formed in the diseased liver acts upon the nervous system, producing a selective lesion in the corpus striatum. They find in Spatz's observation (*cf.* Medical Science, 1922, VI, 493) that the globus pallidus and substantia nigra contain an excess of iron pigment, an indication of a special biochemistry in these structures which might under the conditions of disease lead to selective destruction of them. Apparently certain structures in the eye would be similarly affected, as the present case indicates. Unfortunately, the authors have voluntarily restricted the scope of their discussion on the subject by confining their attention to German writings exclusively. [F. M. R. Walshe.]

Runge, W.. Akinetic-Hypertonic Symptom Complex. [Arch. f. Psych. u. Nervkr., Vol. LXVII, Nos. 2, 3.]

Runge points out in the first part of his study a readiness for tremor almost always present in the akinetic-hypertonic cases even though the rigidity is so slight that ordinary methods scarcely reveal it. It is only in isolated cases which show wax-like rigidity, strongly cataleptic symptoms and slowness of movement, cases which remind one of the catatonic states, in which neither this readiness for tremor nor any sort of tremor in the rigid muscles can be called forth. Measures which call forth the tremor or strengthen that already present in the other akinetic-hypertonic cases, cooling, psychic influences, or subcutaneous injections of cocain

and adrenalin, have no effect in these cases. Intramuscular application of the same means brings about a lowering of the rigidity. Atropin which seems to attack the muscle directly to a certain degree lessens the rigidity as it does the tremor. Runge believes that these facts indicate the participation of the vegetative nervous system in the production of the rigidity as of the tremor. Investigations with creatinin do not disprove this. Yet he believes that the vegetative nervous system is only partially responsible. The results of investigations of the action stream suggest tetanic processes, so one may suppose a combined tetanic and tonic condition.

In the second part Runge discusses the disturbances of temperature in the akinetic-hypertonic cases. He calls attention to the strikingly high dermal temperature appearing now and again, strikingly low body temperature, evidences in disturbances of regulation in the falling of the temperature after taking nourishment, with a less prompt restoration of temperature after chilling, although the trembling appears prematurely. This trembling resembles that otherwise observed in these cases, appearing like an exaggerated form of it. Runge urges more exact investigation of the temperature regulation, of the loss and the production as well as of the metabolism in these cases. Lowering of the heat production seems to belong to these akinetic-hypertonic cases as it does to paralysis agitans.

6. ENCEPHALITIS.

Hohman, Leslie B. Post-Encephalitis Behavior Disorders. [Bull. of the Johns Hopkins Hosp., Oct., 1922.]

This study of eleven children who were brought for treatment to the Phipps Institute because of profound changes in character and behavior. In every instance the change had been so sudden and so complete that it seemed as if a specific etiological agent was at work. In every instance this change had followed an attack of epidemic encephalitis. The author lays stress on the fact that the condition is apparently not uncommon and points out that sick children are very apt to be classed merely as bad children and treated accordingly. He has, moreover, observed certain reactions which are usually classified as purely functional or psychobiological in nature, but which in his opinion are closely related to organic changes. The author does not think that the constitutional factor is of great importance in these children. Unlike Franchioni, who found a neuropathic background in all the children studied by him, the author found that only two among eleven children had shown any abnormality before the development of the infection. The most striking changes were in the character and behavior of the children. They became irritable, quick tempered, boisterous, quarrelsome and sometimes showed streaks of brutality. Their behavior towards school teachers and parents underwent complete change. They became destructive of

property and careless of their personal appearance. In some instances exhibition tendencies and extraordinary sexual precocity were present. In many instances inability to sleep occurred. Psychotherapy was useless. Overtalkativeness and spasmodic movements were a common feature. In dealing with these children the author has been unable to find anything that is of permanent value as a therapeutic agent. Time appears to be the sole healing factor. Punishment does not assist in any way, but the author thinks that a moderately rigorous régime should be instituted.

Price, George E. Epidemic Encephalitis. [Am. Jour. of the Med. Sc., Vol. CLXIII, p. 871.]

End results of the cases in the series were divided into three groups: Complete recovery, incomplete recovery and death. Approximately one-fourth of the cases (24 per cent) died. Of the remaining three-fourths, over 60 per cent were left with persisting symptoms or permanent sequelæ, such as dilated and inactive pupils, mental symptoms, convulsive seizures, tremors of the paralysis agitans type, neuralgia, diplegia, hemiplegia and bulbar crises. In two instances the encephalitis had complicated pregnancy, one patient dying shortly after she contracted the disease, the other being delivered at term of a healthy child by Caeserian section. Thyroiditis developed during convalescence in one case.

The ages of the patients ran from sixteen months to eighty-two years. In discussing the symptomatology, special reference was made to the frequency of changes in the abdominal reflexes in encephalitis and the writer thought that this symptom had not been sufficiently emphasized. Price believes that in certain instances epileptiform attacks have occurred as the sole neurologic manifestation of the disease and gives several abstracts of case histories in support of this statement. Relapses were of frequent occurrence, but bore no definite relation to the severity of the initial symptoms. Nothing new was reported with reference to laboratory findings or treatment. The writer discusses diagnostic difficulties, such as differentiating from brain tumor and veronal poisoning; between encephalitis of the apoplectiform type and true apoplexy; convulsive seizures resulting from encephalitis and those resulting from other causes. Only one case of true acute anterior poliomyelitis came to the writer's attention during the entire period of the epidemic. [Author's abstract.]

Price, G. E. Abdominal Reflex in Epidemic Encephalitis. [J. A. M. A., March 31, 1922.]

In an earlier paper (June, 1922) I mentioned the frequency of changes in the abdominal reflex in epidemic encephalitis, and stated that I felt this had not been sufficiently emphasized. With this thought in mind, the last fifty cases examined (most of them seen during the epidemic of the past winter), have been carefully studied with reference to this symptom, with these findings:

Normal reflex in all quadrants	8
Absent reflex in all quadrants	26
Absent reflex in one quadrant	6
Absent in quadrants of one side, normal opposite side	2
Absent in quadrants of one side, present but rapidly exhausted on opposite side	3
Absent in upper quadrants, normal in lower quadrants	1
Absent in upper quadrants, rapidly exhausted in lower quadrants	1
Present in all quadrants, but exhausted after two or three attempts	2
Present in all quadrants, but distinctly exaggerated on one side	1
Total	50

The abdominal reflex was normal only eight times, or in 16 per cent of the cases, and in the patients seen within one month of the onset of the disease only three presented normal abdominal reflexes in all quadrants. Of the remaining five patients, one had developed the infection six months previous to the examination, one eight months, two two years and one three years. To offset this, the reflex was absent in all of the abdominal quadrants in patients as late as one and one-half years, one year and eight months, and two and one-half years after the initial infection. On the foregoing facts, I feel justified in concluding epidemic encephalitis, and that when the case is seen early (within the that change in the abdominal reflex is an important diagnostic sign of first month), it is the most frequent single neurologic symptom. It may be of interest to note that during the epidemic of the past winter in the Northwest, the radicular and myoclonic types of the disease predominated, and that the greatest number of cases developed during or shortly after a severe cold wave, in which the thermometer registered from 10 to 15 degrees below zero. [Author's abstract.]

Holst, J. E. Sequelæ of Epidemic Encephalitis. [Ugeskrift for Laeger, Vol. LXXXIV, No. 25, p. 852.]

Krabbe compares the classic form with the more frequently encountered form of disseminated sclerosis, and emphasizes the differences. In ten of the thirteen cases described there was no nystagmus, no tendency to scanning speech, and no intentional tremor. In one of the others there was slight nystagmus. But the whole group show that the optic pyramidal type of the disease is more common, at least in the beginning. The symptoms to be looked for are temporal optic atrophy and spastic and reflex anomalies in the legs. Next in frequency comes the group with

diplopia and slight sensory and sphincter disturbances. Third in order comes the Charcot triad, the classic type of multiple sclerosis. Some of the patients described were treated with arsphenamin, and favorable reports have been published elsewhere. The drug certainly has done no harm, and there is an increasing tendency to regard the disease as of infectious origin. The earlier it is diagnosed, the greater the prospects of benefit from the medication.

Parker, H. L. Respiratory Rhythm and Encephalitis. [Arch. of Neur. and Psych., VIII, No. 6. J. A. M. A.]

The histories of eight patients, seven of whom were children, suffering from a disturbance of the respiratory rhythm are cited by Parker. While four of the patients had had an infectious illness worthy of the diagnosis of epidemic encephalitis, the remaining patients dated their illnesses from an infectious episode or febrile illness. In seven patients the onset occurred during the first three months of 1920. The main features of the clinical picture in these cases were paroxysmal stretching, breath holding, grunting and forced noisy respiration. In others there was constant dyspnea, assocciated, in one case, with posture. The average duration of the illness was seventeen months before examination at the clinic, and in a few cases there was an appreciable gap between the initial illness and the appearance of the prominent symptoms. The persistency of the symptoms contrasted with the peculiar nature of the disease which was more manifest by night than by day. It was relatively unaffected by various forms of therapy. Combined with the peculiar paroxysmal respiratory attacks were changes in character. The patients were noisy, disobedient, and passionate, whereas formerly they had been well behaved. There was marked insomnia with inversion of the sleep rhythm in the seven children and abnormal drowsiness in the one adult.

Harbitz, F. Encephalitis Lethargica. [Beitr. z. path. Anat., Vol. LXVII, No. 3.]

Harbitz publishes his results of investigation upon three cases of encephalitis lethargica in which he presents as a feature not reported before the presence of polynuclear elements in the infiltration foci. He believes that comparison with similar diseases demands that encephalitis lethargica should be considered as a disease *sui generis*. He brings into question its relation to influenza, but does not answer the question.

Pellacani, G. Chronic Epidemic Encephalitis [Braz. Med., XXIX, No. 41.]

This is another study of the bradykinetic syndrome observed in encephalitis. The amyostatic condition does not interfere with the subjects being able to dance or ride the bicycle when under most circumstances they were more or less helpless cripples from rigidity. He describes two of these apparently paradoxic cases in boys of sixteen and seventeen.

When excited one could join in a running game; the other had distress in breathing from muscular insufficiency, and to overcome this he breathed very fast with loud inspirations. This contrasted with his usually almost inert state.

Ebright, George E. Clinical Differentiation of Epidemic Encephalitis, Acute Poliomyelitis, Botulism and Certain Forms of Food and Drug Poisoning. [Am. Jour. Med. Science, Vol. XVI, No. 2.]

Ebright gives in a very complete and digested form the symptoms and signs found in these conditions:

Poliomyelitis in the several stages of its course is divided into: (a) Incubation period, (b) prodromes, (c) acute stage, (d) paralytic stages, (e) cerebral type, (f) abortive type.

Epidemic encephalitis is considered in most cases a droplet borne disease propagated directly by the exhalations from the mouth from one person to another. The possibility of its propagation by insects, or by convalescent, or immune carriers may be a probable source of the spread of the disease.

The principal lesions in epidemic encephalitis are found in the central nervous system where the basal ganglia and brain stem are particularly affected. The most constant lesions are microscopic perivascular lymphocytic infiltrations and small hemorrhages of the parenchyma.

The visceral manifestations of enlarged spleen and mesenteric glands, ecchymosis in the pleura, pericardium, bladder, and stomach have been observed.

All of which shows that lethargic encephalitis is a systemic infection with special predilections for certain regions.

The blood and cerebrospinal fluid examinations reveal nothing characteristic except a moderate leukocytosis in the former, and an occasional pleocytosis and increased globulin in the latter.

The Lange colloidal gold curve, usually negative, may sometimes reveal a moderate luetic, or more rarely a paretic curve. The Wassermann test is uniformly negative in uncomplicated cases.

Poliomyelitis: The rapidity of the course of symptoms in poliomyelitis is sharply contrasted with the spread out course with occasional remissions in epidemic encephalitis.

Encephalitis: The author is always suspicious of epidemic encephalitis, especially when preceded by influenza, if two or more of the cardinal symptoms of the disease occur, viz., lethargy or somnolence, marked asthenia, irregular fever, and cranial nerve palsies.

The lethargy of epidemic encephalitis is quite different from the mental condition of poliomyelitis, or of botulism.

Botulism: Botulism may be compared with poliomyelitis. In the former there are no prodromes, no fever, and no paralysis of the muscle groups of the extremities, but the posterior neck muscles may be paretic

with a tendency of the head to fall forward. In poliomyelitis the anterior neck muscles may be weakened and the head has a tendency to fall backward.

When botulism is considered in the differential diagnosis Ebright calls attention to the fact that ingested food may remain in the stomach and intestines of the patient for several days. The contents of these viscera should therefore be examined for botulism and its toxin in suspicious cases.

Poisoning: Veronal poisoning may sometimes produce symptoms resembling encephalitis.

Wood alcohol poisoning, the mental symptoms and optic nerve changes differentiate it from botulism and poliomyelitis. [Author's abstract.]

III. SYMBOLIC NEUROLOGY

3. PSYCHOSES.

Heveroch, A, Confusional Paranoia. [Cas. lek. ceskych., Nov. 3, 1923. J. A. M. A.]

Heveroch differentiates from schizophrenia a group of affections which he calls taractic paranoia, from the Greek *taraxis,* "confusion."

Hoch, Theodore A. Acute Psychoses with Symptoms Resembling Dementia Praecox. [American Journal of Psychiatry, Vol. I, No. 3.]

The author presents several cases in which the mental picture is that of schizophrenia but which were eventually classified otherwise on the basis of other than mental data. [Menninger.]

Minogue, S. J. Intelligence of Criminal Insane. [Med. Jl. Australia, April 26, 1924. J. A. M. A.]

From a study of forty-five patients certain broad deductions are drawn by Minogue: that persons of superior intelligence are more prone to murder; that the low grade imbecile is more prone to indecent assault and robbery and, as a rule, does not belong to the habitual criminal class, evidently because his mental deficiency is so obvious that it is recognized at the first crime and he is put under proper care and control; that those who have numerous convictions against them and are mentally deficient, are either the high grade imbeciles or morons. In such cases the mental deficiency is not apparent on superficial examination and can only be demonstrated by the methods of Binet-Simon or their modifications or by the taking of a careful personal history. If the routine examination of the intelligence of criminals were carried out, the mentally deficient could be found early. They could then be put under proper care and control and by careful method in the majority of cases useful tasks could be taught them and work useful to the community could be performed. This segregation of patients is in the great majority of cases no hardship on them. As long as they are fed and comfortable, their environment matters

little to them; they are devoid of ambition, their lives are aimless and futile.

Joel, E. Cocain Addiction. [Med. Klin., June 17, 1923.]

Joel has frequently witnessed that cocain addicts with complete change of environment were able to conquer their craving for the drug for months at a time, but when they returned to their former surroundings, they relapsed. This should be borne in mind in planning treatment, especially, he says, as with cocain snuffing there is no acquired poison-fast condition, like that with morphin and alcohol addiction. In several of his cases the cocain addiction could be traced to a physician's prescription for hay-fever. In conclusion he remarks, "I think we owe it to ourselves and to the prestige of our manufacturing chemists to put an end to the peculiar rôle we and they are now innocently playing in that we are supplying with cocain the addicts not only of Germany but of almost the whole of Europe." He adds that the law provides for limiting the import of coca leaves to the actual demand. This gives a lever which will enable the cocain evil to be uprooted.

Stärcke, A. Psychoanalysis and Psychiatry. [Int. Jl. Psa., II, Pts. 3–4.]

As yet psychoanalytic therapy for the frank psychoses has not been as effective as in the transference neuroses. Nevertheless the entire psychotic fabric has been vastly modified and newer interpretations of psychopathology are numerous as a result of Freud's stimulus. The author here speaks of the nonanalytic psychiatrist when he speaks of psychiatrist and analyst as dissimilar in their nature. He has in mind the true descriptive psychiatrist, more interested in diagnostic and social than in psychopathological problems. He aptly terms much psychiatry as glossolalia. Freud's denial of his narcissism gave more libido to the object-scientific insight—and enabled him to break through prevailing modes of expression, such as rich literary acquaintance, overcoming taboos of other languages, working with developing rather than limiting concepts, with fluid rather than fixed logical systems, the absence of "replies to the preceding reply" the replacement of the antithesis "either-or" by "and-and." Freud's accent was on the investigator—he needed improvement. He must forego his narcissism if he were really to be an investigator; the analyzer needs to "know himself" else he is helpless in knowing his neighbor, sick or well. The psychotic field is not really as difficult as it has been imagined. Psychological fossils here lie on the surface but the nonanalyzed individual cannot see them in their true significance. It is chiefly because of this that such a painstaking series of "tests" as for instance Sommer of Giessen has devised are sterile. The author illustrates the differences of information derived from a questionnaire and that from a simple analytic approach to the problem. The results were absolutely dissimilar. The difficulties, almost insuper-

able, in institutions for the establishment of the right kind of transference are very keenly outlined. "Sublimation" as an arrogant assumption of a philosopher might better be replaced by "taming" or "domestication." It smacks a little too much of individual narcissism. Personal judgments of value are to be avoided.

"The psychoanalytic psychiatry which has developed from the Freudian 'behavior' psychology of the human being has further aims. It should not be forgotten that it has a double task. When the analyst teaches the individual to limit his libidinous expressions to what is allowed by society, and to lead the infantile fixed libido again to civilized aims, and educates him to endure mental privation, he has then a second more comprehensive duty towards society, which, although dictated by the same healing endeavor, leads in an opposite direction. He must reconcile society with the libido, with death, in short with the unconscious. This then will be the last and practically important consequence of the difference between the psychiatrist and the analyst. The old style psychiatrist is a servant of the censorship, an instrument of society, he treats the 'outcasts.' The analyst, who has here and there to some extent pushed aside the barrier of the censorship in himself, should use society itself as an instrument for social progress, he must serve society without reference to the censorship." The reality principle protects against dangers of a direct kind which threaten from without, the pleasure principle against the inner danger of overloading and against remoter biological dangers. To the neurotic the disadvantages of the pleasure principle are made clear, to society the disadvantages of a too exclusive homage to the reality principle must be brought forward. *The normal being, of whom we know least of all, must be discovered, and if necessary cured.* (Italic ours.) [Compare reviewer's use of the title "Ibsen, the *Apostle* of the Psychopath," 1909.]

Stärcke then deals with "the relations between neuroses and psychoses." "Society considers as mad him who threatens to reveal to men its unconscious, and knows no other defense against such revelation than to isolate the madman." This quotation alone indicates the extremely valuable nature of these three pages which defy condensation and should be read in the original.

The "normal and the abnormal," the uselessness of this antithesis the author abundantly shows and we cannot condense. "The mental life of the normal person is a symphony of single performances of the various stages of development. Some of the stages, like sleep, are extremely deep regressions, surpassing the severest psychoses in depth, and strange to say, often absent in these latter." This we hold is sound doctrine to chew upon.

In section III of the paper on metaphrenia, Stärcke develops along the line that the "civilization of the white race is a morbid one." [Do we need the World War to prove it?] He would attempt a more precise diagnosis of this "civilization disease" as Freud in 1908 gave an idea

of it. It is analogous to an "obsessional neurosis" in which the striving for "time and money"—two anal erotic factors, characterize civilized society—hygiene and cleanliness seek to exclude love and work. Recreation seems to be the only field left for gratification. "The civilization of the period of industrial production corresponds to a repression to the second pregenital organization of the libido. Again the original must be read to comprehend this.

Section IV deals with Regression—"Civilization demands regression. All those who have not sufficient fixation on the second pregenital organization of the libido will have difficulty in conducting themselves socially." The psychotic refuse flatly the ethical (social) suppression of impulse, the neurotic makes a compromise, the normal submits to society or forces society to submit to them. This is but a thumb sketch of this highly original section.

Clinical facts deals with psychotic symptom complexes, neurotic symptoms, mild psychotic signs in neurotics, signs of illness in other directions. The difficulties and dissolving perspectives, Stärcke deals with under "Freud's classification of the Clinical Entities," in which he makes an effort to show how radical the new alignments are and also how, as yet, they lack descriptive possibilities in spite of the statement that Freud has given the solution to the impasse. He has shown the new direction, but the syntheses are yet fluid. For the present it seems we can generalize upon the following groups: (1) The actual neuroses: anxiety neurosis, neurasthenia and hypochondria. The symptoms are derived from or are direct accompaniments either of sexual (unconscious) stimulation or exhaustion, or of the extraordinary charge of libido of other erotogenic zones. (2) Transference neuroses: conversion hysteria, anxiety hysteria, and obsessional neuroses—further elaborations of anxiety through conversion, protection formation phobias and reaction formation. (3) Other less known transference neuroses which as restitution attempts in paraphrenia (schizophrenia and paranoia) and other psychoses lead the libido again to objects and receive their particular character through the great quantity of negative libido with which they have to deal as well as their permanent tendency to return to narcissism. (4) The narcissistic neuroses—results of the regression of object erotic quantities to narcissism—as they are found in rather sure forms of paraphrenia, but also as one of the chief constituent parts in the other psychoses. (5) The hallucinatory wish—psychoses—constituent parts of amentia, dreams and paraphrenia. The author's striking analogies as applied to the "normal" individual are of interest. "Metaphrenia," the "normal" phrenias, of those obsessed by "time and money" compulsions, consists of: (1) The remainder of the earlier phases, orthophrenia; (2) an obsessional neurosis (products compulsion); (3) a narcissistic neurosis (idealism); (4) an anxiety hysteria (overdeveloped hygiene, etc.; (5) transference neuroses of the second group (domestication, formation of the state, etc.).

The further developments of the author's thesis must be left to a reading of the original stimulating and striking article which closes with this sentence: "At the present time when equilibrium is so unstable, we too are responsible for the coming reconstruction, and the demand must be made that not only should man adapt himself to society, but that society should adapt itself to the peculiar needs of man."

Kollarits, Jenö. Biology and Psychology of Sorrow. [Natur und Mensch, Jhrg., II, Nos. 7, 8, 9, pp. 243.]

The author attempts to put upon a scientific biological and psychological basis the question of comfort so important to sufferers, physicians and priests, not to treat it as so far it has been handled in consolatory tracts. The conditions for consolation are internal and external. The inner condition lies in the character which determines the individual reaction to the blow of fortune. Pleasure toned, depressive, neutral characters have their own manner of bearing sorrow. The special tone of the sphere which is affected is of importance. The inner condition is specific, the outer ones are auxiliary factors. Schopenhauer has spoken similarly in other words. The majority of mankind returns sooner or later to psychic equilibrium, completely or nearly so; a minority suffers without end and comes to grief physically and psychically. The final stage in the character is not the pleasurable tone but the form of the organic striving (von Monakow's horme). The pleasure toned character has a strong horme, the pain toned character a weak one. The organic striving also may be unequal in different directions. Since the suffering is a reaction to a blow of fortune it has a curved course like other reactions. In sorrow too one is weary. The mechanism of the struggle against the sorrow is discussed from the psychological side. Work is the greatest force which turns us from sorrow, not only through diversion but far more because it serves the purposes of the will to live. The author pictures the way in which the new experiences press the memories of the sorrow to one side until these give way in themselves. The external factors of consolation have to adapt themselves to the service of the organic strivings, to assure to these ways and means for activity as soon as the first phase of the sorrow, in which not diversion but rest in necessary, has passed. It is shown in the examples of Seneca, Boetius, Master Eckehard, Pasteur, that the value of arguments which would set themselves in opposition to the sorrow is less than the value of sympathy; also that religious comfort is an emotional comfort; further that all these factors are only subsidiary factors to the specificness of the organic striving of the individual. Questions of inadequate reactions in trouble, the sorrow of the folk psyche, the suffering which is shown in the checking of the organic striving of a people are touched upon. The author judges the distance between pleasure and pain as less considerable than is commonly accepted since even the feeling of pain melts away as that of pleasure disappears when the goal is reached. Really the period of

expectancy seems to be the high peak of the feeling of pleasure. The author stresses the pleasurably toned components of sorrow in normal and abnormal cases. He designates pain as an enriching experience and thinks that to him who has not known sorrow important notes in the scale of life's feelings are wanting. [J.]

Carroll, Robert S. Aseptic Meningitis in Combating the Dementia Precox Problem. [Journal and Medical Record, October 3, 1923.]

It has long been noted that conditions which cause an increase in leucocytes tend to bring about at least temporary improvement in the mental condition of dementia precox patients. In 1895 Dr. Adolph Meyer had written: "Whether, indeed, the lucid intervals and rapid improvement of torpid cases after infections which produce leucocytosis (typhoid fever, tuberculosis, suppuration, and other conditions) might be due to the fresh regenerative impulse, will be a question worth examining." The work of Mehrtens and MacArthur demonstrated that the injection of sera into the spinal canal, thus producing meningeal irritation, the choroid is made more permeable. Thinking to produce a leucocytosis and free "fresh regenerative impulse" at the point where it might accomplish most—in the central nervous system—and to possibly alter the nutritive qualities of the cerebrospinal fluid by action on the choroid it was decided to introduce 25 c.c. of inactivated horse serum intraspinally after withdrawal of an equal amount of cerebrospinal fluid in a case of marked catatonic stupor. After the second treatment great improvement was observed. The treatment was used in a number of cases. A minimum of two, a maximum of five injections have succeeded in producing either temporary or permanent lucidity in every dementia precox case thus treated. The physical reactions were marked. The temperature usually reaches a maximum of 102.5 degrees with no untoward disturbances of pulse and respiration. Backache and headache are present for thirty-six to seventy-two hours, and nausea, sometimes vomiting, may be expected during the same period. It is common for the patient, during the height of his discomfort, to prefer to stand or lie with his back pressing against a hard surface. A slight strabismus, herpes labialis, generalized urticaria, and an anaphylactic threat with expiratory dyspnea have been observed following a few of our over sixty injections. In most cases, temperature, pulse and respiration have returned to normal within three days. The cytology is interesting. The usual cell count in spinal fluid removed during treatment is: Mononuclear lymphocytes, 95 to 89 per cent; true phagocytes, 4 to 6 per cent; eosinophils, 1 to 5 per cent; neutrophils, 0 per cent.

Of most profound interest to us, however, are the mental reactions. Little or no change has been the rule following the first treatment. The appreciation of reality, in recent cases, has always developed by the fourth injection, usually by the third. In those with hebrephrenic or catatonic symptoms of from four to six months' duration the response

has been more permanent. In chronic cases, those with precox histories dating back three to six years, the reactions have been paradoxical. One patient who had been destructive, resistive and untidy for thirty months; in whom precox symptoms had been observed for six years; who had been mute for practically one year, asked intelligent questions concerning the treatment within two hours. It was found that this girl's contact with reality increased until in thirty hours, when the artificial leucocytosis is at the peak, it would have been difficult to detect any abnormality in her conduct or conversation. With little help she disclosed the mechanism of her delusions, admitted her hallucinations, discussed them as a symptom, wondered at her helplessness in control of them. Then the slow reclouding until at the end of a week she was quite shut in. This case's reactions were largely hebephrenic. A series of case reports are given in the original paper and further reports are promised for a later date. [Author's abstract.]

Butterfield, George K. WHAT HAPPENS TO DISCHARGED PATIENTS. [American Journal of Psychiatry, Vol. 1, No. 2.]

Two hundred and fifty patients discharged in 1918 were investigated in 1920 and 1921. Sixty-three per cent were capable of living out of the hospital. Three have committed suicide. Ninety have been returned to a state hospital, but of these 26 have been once more successfully discharged. One hundred and seventy-eight have been economically successful. Twenty-three of these were on a higher occupational level than before. [Menninger.]

Kollarits, Jenö. NATIONAL BIOLOGICAL AND PSYCHOLOGICAL EVOLUTION FROM SELF-DETERMINATION TO MUTUAL DETERMINATION. [Natur und Mensch., Jhrg. III, pp. 23–30.]

Biological politics have as their task the study of the evolutionary process of the nations upon a biological-psychological basis, that the laws of this evolution may be determined in order to give a surer basis to the guidance of the nations in their careers. These must be removed from the hands of the orator-charlatan politicians of whom Auguste Comte 100 years ago showed that they could have no ability for performing this task in a world-wide manner. The state is an organization, the people an organism. If both coincide all goes well, if not there is friction. The individual members of the national complex are engaged in carrying their internal structure to the limits of its possibility. The internal structure, intention, comes into collision with other peoples and expansion toward them results. The boundaries between both are fluctuating. The feeling of pleasure in activity stands side by side with the organic striving as its psychological correlate while ideologically stands the "right of self-determination," which likewise in practice does not respect the boundaries of intention. The possibility of maintaining these boundaries is given by the impulse of flight from pain which comes from

the contact of the nations. Who is the bearer of the strivings and the feelings depicted? There is no isolated personality for it. Neither the personality of the individual nor that of the nation, the class, the language nor any other group is isolated as regards the external world. The individual units collide one with another, yet they cohere. The units of the lower levels attain in the higher unity to another organic and psychic relationship with one another, they become common organic members of the superindividual. The collective psyches feel themselves as such. We find ourselves today in the embryonic stage of a life representing a gigantic group of a supernational sort which has supernational strivings and feelings. The unevennesses of development of this level conditions our social and international sufferings. The nations however cannot be submerged in the superorganism just as the individual human being does not surrender his personality in the family and in the community. Yet no people, as no human being, can be completely independent of other individuals and of other nations; all place themselves under the higher group without losing their autonomy. In this striving and psychically mutual determination corresponds to self-determination, ideologically the right of mutual determination to the right of self-determination. [J.]

4. MEDICO-LEGAL; SOCIAL.

Burridge, et al. The Problem of Drug Addiction. [B. M. J., March 31, 1923.]

Lord Justice Atkin presided over a meeting of the Medico-Legal Society on March 20, when a paper was read by Dr. H. A. Burridge, lecturer on forensic medicine and toxicology at King's College Hospital, on the subject of state effort to rescue drug victims, with special reference to the dangerous drugs act. Dr. Burridge contrasted British and American methods of dealing with drug addicts. On this side of the Atlantic the American principle of correlating treatment with penal repression had not been followed, nor had there been sufficient survey of drug addiction before legislative enactment. Not only the medical, but the legal mind in the United States regarded the drug addict as a sufferer rather than a criminal. He gave some figures to show the large extent of drug addiction in America. Among other proofs, it was stated that in the court of special sessions in New York county at least one-tenth of the business was concerned with drug addicts, and if offenses which were really the result of drug addiction were included the proportion was much greater. In America any magistrate, on a complaint being made, might commit the drug addict to a state, county, or city hospital. Dr. Burridge cited particulars of some recent prosecutions in this country to illustrate the inequalities, injustices, and irrelevances of the English law, and he criticized several points in the dangerous drugs regulations, particularly those relating to prescribing and to

record keeping by medical men. He regretted that those who initiated recent legislation and the proposed amending legislation should have caused confusion and created stumbling blocks simply by their failure to take the general practitioner into counsel. This dangerous drugs act seemed as if it might become known as the "Dangerous to Doctors Act," and half the members of the Medico-Legal Society might presently be employed in keeping the other half out of prison. He pleaded for the setting up of a proper advisory committee to thrash out the necessary amendments to the act of 1920 as suggested by actual medical experience, and thus the sudden eruptions of fresh regulations at the instance of a government department might be avoided. The American authorities (Dr. Burridge continued) had tackled the subject of treatment in a way to evoke admiration. The result of an official inquiry in the United States might be broadly stated as being (1) that there was no known specific remedy for drug addiction, and (2) that the cocaine habit more readily responded to treatment than the narcotic habit. The best results were obtained when the victim was in some kind of custody, not in prison, but in a controlled sanatorium. The American experts regarded heroin as the most dangerous drug in the category, especially because of its attractiveness to the young. The heroin habit was said to have grown to extremely large proportions in America, and the average age of its victims in the area covered by one inquiry was twenty-two. Some experts contended that without injury to medicine this drug might be banished altogether. Dr. Burridge thought it of first importance, in approaching the question of treatment, to endeavor to discover the mental and moral condition of the addict. A person struggling alone to loosen the bonds of the drug habit was engaged in a task like that of Sisyphus himself. Until self-respect had been reëstablished there was no hope of cure. It was an absurdity if not a crime to commit these people to prison, where the last shreds of their self-respect would be lost. His suggestion was that they should be committed by the magistrate to a home, preferably a farm, and that, perhaps six weeks later, they should be brought before the same magistrate, who would sit with a medical assessor, and evidence would be given by a medical officer of the institution to which they had been committed. Upon the decision of the magistrate they could be released on their own recognizances or committed for a further period. He deprecated heavy fines and prison discipline, unrelieved by remedial treatment.

Classification of Addicts—Sir William Willcox said that drug addicts fell into two classes. The first were the unfortunate people who had become victims possibly owing, in the first instance, to a medical prescription or to their own curiosity. These people were intensely concerned at their state, and wandered about from one doctor to another, thereby giving rise to the impression that they were more numerous

than was actually the case; many of them were originally mentally unstable. Any treatment of this type of case, unless under strict supervision and control, was quite futile, but with such safeguards the prognosis was not so unfavorable as was popularly supposed. Sir William Willcox suggested that there might be some kind of state certification of such persons, somewhat similar to that employed in the case of persons of unsound mind. Another class of drug addicts were degenerates who haunted disreputable resorts and lived on a succession of debased socalled pleasures. These cases were numerous, and were not often seen by medical men, but a lurid light was occasionally thrown upon their existence by some revelation in the police or coroners' courts. It was well to remember that the drug habit became really dangerous when the drug was taken hypodermically; it was less dangerous when taken by the mouth. He agreed that the regulations under the dangerous drugs act were very irritating to the general practitioner, but he thought that they would be gradually revised in the light of experience and made more workable. Of course the underlying evil would never be countered until not merely the sale and distribution of the drugs, but their production was under control.

Lord Riddell said that the clauses of the dangerous drugs and poisons (amendment) bill now before parliament appeared to be far too complicated and to impose an undue burden on the medical practitioner, but it would be the fault of the medical profession itself if it did not get the bill altered. The medical profession had only to say that these proposals were unworkable and they would not go through.

In some further brief discussion one or two speakers made the point already put forward in the leading article in the British Medical Journal of March 17 (p. 477), that in the dangerous drugs and poisons (amendment) bill a discrimination was made between registered medical practitioners in actual practice and registered medical practitioners not in actual practice. It was argued that among the latter, strictly speaking, must be included medical officers of health and holders of other appointments.

Mr. Perrins, of the home office, said that he had looked up the records in his department and had found that only seventeen addicts had been prosecuted since the act came into force in 1921, and of these he did not think that more than six were sent to prison. Most of them were sent directly to a home, or were remanded for that purpose. The heavy penalties were reserved for the people who deliberately trafficked in drugs. With regard to the requirement that only doctors engaged in actual practice should be allowed to prescribe, this was inserted as a safeguard against those few members of the profession who were "down and out," having lost their practice for some reason, and who might try to make a living by prescribing for addicts. He spoke only as an individual, not as a representative of his department.

A Judicial View—The President said that he believed the medical profession as a whole was deeply conscious of the evil involved in the drug traffic and sincerely anxious to do everything it could to mitigate that evil. He could not help thinking that the true way of setting to work was to trust medical practitioners, not to create difficulties in their path when they were engaged in the ordinary bona fide practice among their patients, but to provide for the most severe penalties upon doctors who evaded the provisions of the act for the purpose of supplying drugs improperly to addicts or obtaining them improperly for themselves. If the medical profession agreed to this very proper line the authorities might be induced to modify some of the more irksome provisions with regard to dispensing and record keeping. Dr. Burridge had chiefly praised in the American procedure the efforts made for the cure of addicts by sending them to institutions; but, whatever might be the case in America, in this country there were not enough institutions for this purpose, and it would be impossible to deal with this matter until the state in the first place had seen to it that there were institutions sufficient in number and large enough in accommodation to which the courts could in cases of necessity commit the persons who were brought before them and were proved to be addicts. This had not been a very popular form of procedure so far in this country, and he rather trembled at Sir William Willcox's suggestion that some such method might be adopted as was at present in force for certifying lunatics. Another board of control would be required, together with an elaborate system, involving dangers which might in the end defeat the object in view. Possibly it would suffice for the ministry of health to supervise and encourage the growth of private institutions, which might perhaps be assisted from public funds.

A good deal had been said (Lord Justice Atkin continued) in criticism of the nature of the regulations. He himself was not competent to deal with those criticisms, but it was a remarkable fact, and one which showed the tendency of modern legislation, that in the dangerous drugs act, 1920, there should have been hardly any coercive provisions at all. That act laid it down that regulations might be made, it was not definitely stated by whom, but there was a subsequent reference to the "Secretary of State," and the implication was that the regulations would be made by the home secretary. In the result the home office was left to make the whole of the regulations, infringement of which exposed the offender to the penalties prescribed by the act. One would have thought that provision might have been made whereby the proposed regulations would be published in draft for criticism by the medical profession before they took final and effective shape. He contrasted some points in the regulations with what was proposed in the dangerous drugs and poisons (amendment) bill, and urged the need for all such proposals to be placed before the

medical profession. In the case of the bill the proposals could, of course, be examined and criticized before they became effective, but if he were a medical practitioner he would feel it a little alarming to be told that the home secretary had made certain regulations and that they would be published at a certain time, without knowing in advance what those regulations were, or without his profession as a whole having had the opportunity of seeing them and of submitting whatever was to be urged in respect of them: that might well be a genuine grievance. Those who had taken part in the proceedings in criminal courts would feel that the whole question was one of great importance. There the cases were usually brought forward on the charge of "being in possession." It was not a criminal offense to be an addict, but it was a criminal offense to be in possession of the drug, and this, of course, brought in the addict. In such cases the court would generally deal with the matter by using its powers to bind over the offender on certain terms or to put him under some kind of special probation, but there was a difficulty in committing any person compulsorily to any form of institution. That could only be done on the condition that the person concerned would be able to secure his release upon certain terms. When the case arose of a drug addict committing a crime, possibly owing to the deterioration which had taken place in his character, it could be dealt with more simply, and in some cases the most humane course was to treat it as ordinary crime, so as to secure that the offender was put in confinement in a prison for a reasonable period, during which, of course, he would not have access to the drug, while he would have competent medical treatment.

Myers, C. S. Psychoneurosis and Mental Deficiency. [B. M. J., March 31, 1923.]

At a meeting of the Section of Psychiatry of the Royal Society of Medicine Dr. C. S. Myers gave details of two cases in point, both of youths of adolescent age who had the minds of children of six or eight. In both cases the influence of an early emotion was pronounced, in one that of fear, and in the other that of a germinating sexual feeling. The original experience (that of a funeral) of the first was not repressed at all, but the youth was very voluble on the subject, and all his talk was colored by the circumstances of death and the grave. In the second case the original experience was only recoverable in the hypnoidal state, and the removal of the repression seemed to bring about a noticeable improvement. In this case the demeanor of the lad was one of prurient curiosity. Dr. Myers suggested that not only was the mental deficiency responsible for the gravity of the psychoneurotic condition, but that the latter reacted in turn on the slowly developing mind of the mentally defective child and aggravated the deficiency. It was unlikely that mental deficiency was ever directly and solely due to a

psychoneurosis, but he was convinced that certain cases of mental deficiency could be enormously improved if attention were paid in early life to any concomitant psychoneurotic disturbance.

Hübner. Sexual Constitution and Jurisprudence. [Berlin Letter, J. A. M. A., April 7, 1923.]

This author showed how a knowledge and consideration of the sexual motives in all criminal cases open up an entirely different point of view in dealing with "amateurs," and allow one to judge their conduct much more justly. He discussed sexual suggestibility and various problems pertaining to the relations of the sexes, which must be better understood before we can establish a just system of criminal law and avoid treating disease as crime. Great importance for the further development of sexual science attaches to the statements of Professor Matthes with reference to the establishment of types and the difficulties of the problem, owing to the fact that we must consider not only environmental influences but also the modifications in character, since the same individuals in the course of their life undergo most remarkable constitutional changes.

Book Reviews

Culpin, Millais. The Nervous Patient. [H. K. Lewis & Co., Ltd., London.]

This is a delightful book by one " who went out to mock but who returned to pray." A surgeon with all the old orthodox prejudices born of the " will to power " and other incantation throwing out of devil's notions, high frequency current pain treatments, etc., who, confronted with the shell shock cases in English soldiers, finally came to see that the human being is a much more subtly interwoven fabric of instinctive trends than the orthodox methods of medicine cares to admit—and wonder of wonders, one who admits it!!

Here is a thoroughly human document, filled with understanding and a keen insight into the problems of the neuroses and psychoneuroses and also alive to the psychical components which may contribute to so-called organic disease. Thus there is an illuminating chapter on Eye Symptoms in their psychological setting and also an excellent discussion of the Major Psychoses by Stanford Read. It is gratifying to note that this author has accepted the viewpoint so long insisted upon by White and Jelliffe, that the term " insanity " is a purely legal concept, and practically quotes White's statement that it only implies the attitude of society towards the sick individual: as to whether he should be segregated or not, and the kind of segregation chosen.

It is a very sensible and useful book and should have a wide reading by the general practitioner for whom it is chiefly written.

Menge, Edward J. General and Professional Biology. Vol. I. General Biology. [The Bruce Publishing Company, Milwaukee, Wis. $4.00.]

More and more apparent becomes the need for a better background of verifiable facts bearing upon human behavior not only for the student of medicine but for all the members of an intelligent herd, and more and more one is looking towards biology as a discipline, to open the way for the gathering of this needed knowledge.

The medical student is specially served by a good background of botanical and geological observations and resultant principles, and in this rather unique volume such service is projected. It is unique in its mode of approach, which is quite humanistic, and further the general trends of its expositions are fundamentally sound. At times the author is quite naïve, but this is often a great relief when one considers how excessviely pedantic most elementary texts are.

On the whole this is a very serviceable elementary work on biology

which has many interesting and unusual features of pedagogic stimulus and value.

Levy, Gabrielle. Les Manifestations tardives de l'Éncephalite Epidemique. Preface de Prof. Pierre Marie. [Octave Doin, Paris.]

The author presented this work originally as a Doctorat thesis and it now appears in a revised, augmented second edition. It analyzes 129 cases of epidemic encephalitis from the Salpétriére service of Pierre Marie, who in his delightfully piercing and keen preface notes, "How can it be understood that the polymorphic manifestations of encephalitis can be the unequivocal results of this pleiades of minute lesions in their adventurous scattering?"

The descriptions of the author are of a luminous clarity and one can read with interest all that pertains to her own observations (in collaboration with her chief), particularly all that treats of the excito-motor syndromes and to the respiratory troubles.

With extreme prudence no hypotheses are advanced, but the questions to be resolved are put forth with much neatness, particularly the pithiatique problem, a chapter far from being closed (p. 148 and following).

It is to be regretted, however, that the author has not taken up the problem of the day of the relationship between subcortical activities and the psychiatric forms of encephalitis. It is possibly because of the absurd separation of neurology and psychiatry unknown anywhere else save with the French.

This excellent book closes with a complete bibliography of the French work. The typography is exemplary, but unfortunately there is no index. R. Mourgue (Nimes).

Van Teslaar, J. S. An Outline of Psychoanalysis. [Boni and Liveright, New York.]

Dr. Van Teslaar has here had the happy idea of gathering some of the various aspects of the analytical psychology into a volume by means of a careful selection of representative studies.

In the main for the general lay reader he has chosen his papers with considerable skill. He has not, however, shown the fundamental reasons for certain divergences in analytic thought, a subject which, recognizably difficult, is not without considerable practical as well as theoretical importance, especially for the layman who, thinking that all psychoanalysis is the same, may find the Atlantic City boardwalk variety a dangerous, spurious article.

Van Teslaar could have shown the tendencies of the different disciplines. The Freudian psychoanalysis is primarily objective, medical, and painful for the patient who must give up his neurotic treasure. The Jungian precepts lead readily into religious, subjective, and mythological fields, and hence are most readily taken up by the quacks, who push it beyond its scientific confines into the numerous perverse erotic cults. The Adlerian postulates are dear to the soap

box orator, the outlaw, and the radical. It slops over into getting even with the "big fellow." A useful discipline in the study of the anal erotic, egoistic trends, but with little or no insight into the creative life of the individual.

But inasmuch as psychoanalysis has now grown far beyond the grasp of any one individual, the suggestion just made may not be as practical as deemed. There are individuals who still are "anti-vaccinationists." It is a great pity that they could not be exposed to smallpox, and thus nature would weed out such incompetents; in the same way, if people want quack psychoanalysts let them perish thereby. Prohibition from without apparently has never stopped anybody: The laws of Moses are still more observed in the breaking than in the making.

Let us hope this little volume will teach from within and be of service to sick humanity whose "normals" are so sick they don't know it.

Allport, Floyd Henry. Social Psychology. [Houghton Mifflin Company, Boston, New York, Chicago, San Francisco; The Riverside Press, Cambridge, 1924.]

This book avoids the discussion of sociological problems from a generalized theoretical point of view. It is concerned rather with a direct examination of psychological facts which grow into the structures we know as social relationships. The author's psychology is very clear and direct. It makes detailed observation of the activities of the organism in its physiological behavior as this results in, and is conditioned by, the realization and the fulfilment of personal reactions in the psychic life or "consciousness." The study is that of an individual psychology. Social psychology, to the writer, is only that of individuals. He troubles himself little about a catalogue of instincts as the individual's equipment upon entering life. His practical method is not to be confused by the theory which "begins at the wrong end of the developmental process . . . and reads back into the life of the child an inherited purposive development . . . determined wholly from within." He is interested instead in the building up of learned reactions as the basis of individual and social life. The conditioning of the reflexes, habits, behavior, is the keynote of the volume. The chapter on the child's sex development, together with the entire discussion of the place of sex in the personal life and in the socialization of that personality, particularly reveals the author's soundness and practical clearness of view. We do not see that anything is gained by substituting "sensitive" for Freud's "erogenous" in relation to the areas in which the child's love life is first experienced. Nor can we agree that the sexuality itself only enters at puberty, but the principle of the formation of the child's sexual life through the early years and the parents' responsibility to this are excellently brought out. The book is unusually well supplied with instructive footnotes and with a full list of references at the end of each chapter.

Sullivan, W. C. Crime and Insanity. [New York: Longmans, Green & Co.; London: Edward Arnold & Co., 1924.]

This book should make at least a threefold appeal: It carries much instruction to the members of society who would seriously understand the background of crime as it lies in mental disorder; it is purposely addressed on this ground to students in psychiatry; and thus it should be of equal interest and importance to the legal profession. The author has in mind constantly the actual legal situations into which the coincidence of crime with mental disease leads. The book in fact forms a very illuminating commentary upon the nature of mental diseases as well as upon their relation to crime. This is not of a too technical nature but is of the character of a very practical facing of the actual manifestations of mental disturbance which lead on to criminal acts, of the fundamental conditions out of which these acts arise as symptoms rather than deliberately planned evil deeds. And this point of view is still in much need of emphasis. The writer's purpose is in no way thus to rouse undue sympathy with crime but first of all really to safeguard society through detection of crime at its source. It is to understand the dynamic nature of irresponsible activities which to a large part constitute crime, at least as the latter is involved in the definite psychotic states here discussed. He stresses the need of individual study of each case. The distinction is made or at least suggested between impulsive crimes, such as those to which the disordered mind would turn, and crime more dependent upon economic environmental conditions. Yet this, too, awakens a question of perhaps a closer connection in the deepest etiology between these forms of criminal activity than would appear superficially. This the author has not left unnoticed although one frequently feels that his etiological discussions could profitably have been pushed further into still deeper interpretations. His case material is more than suggestive of the profound conflicts which we have come to know in the unconscious.

Bernfeld, Siegfried. Von dichterischen Schaffen der Jugend. Neue Beiträge zur Jugendforschung. Quellenschriften zur seelischen Entwicklung, Nr. iii. [Internationaler Psychoanalytischer Verlag, Leipzig, Wien, Zürich, 1924.]

The field into which Bernfeld's study leads is one of importance to the student of literature as well as to the investigator of adolescent psychology. And we know that to-day each one of these departments is looking to the other for aid in the discovery of the vital issues at work in human lives and which come to expression through writing. This more or less preliminary assemblage of material makes clear the variety of product expressive of youth. The author has not sought to reveal a formal beginning of literature. Much of the illustrative matter in fact is evidence of the absence of literary merit in the writing to which the child or adolescent turns. By no means every one who at these periods finds outlet in writing is on the road to the profession of letters either good or bad. There is other material, too,

than the definite types of writing which largely form the subject of investigation; namely, play, in the sense chiefly of phantasy play, and those almost formless productions found in early-kept diaries and in letter writing. The author's statement of the number of documents that he has had already under examination, which he modestly counts but a beginning, is a reminder of the vastness of this territory of research, a territory in which necessarily the material is always on the increase. An open mind willing to be guided, unprejudiced by the matter itself, patient to reserve conclusions, is essential for the task. These the author exemplifies. Though he is equipped to apply the experience of psychoanalysis to the interpretation of the material, he does this only so far as it casts a chance ray of illumination here and there. Classification and interpretation are not matters for the present in a sphere so vast, where causal motives and produced results are of such manifold character.

Forel, O. L, La Psychologie des Névroses. [Libraire Kundig, Geneva.]

This short but complete work, dedicated by a gifted son to a father most favorably known to the scientific world, is a model of scientific presentation. As he tells us in his short and telling introduction, the number of publications upon psychological problems is enormous. To be able to thread one's way between the divergences of opinion, the attitudes of the schools, and many aspects of the rich mental life is no mean accomplishment. To do it in the manner here portrayed excites our admiration.

Psychopathology is probably the most intricate of all the fields of pathology, and it is little wonder that the older students of medicine and particularly of neurology have found it difficult to orient themselves to the kaleidoscopic changes and numerous advances made by many different and divergent investigations. Here is an excellent orientation to the labyrinth which surrounds the neuroses. In it the author deals with the general evolution of our modern psychopathological ideas. He shows the insufficiencies of the earlier experimental psychological academicians, and very succinctly outlines the values of the various terminologies which of necessity have sprung up in so large a field of investigation, paying particular attention to the misconceptions which are too widespread concerning "normals," and discussing with considerable acumen the conceptions of unconscious, subconscious, and conscious. Semon's generalizations concerning the mneme, the engram, and the resulting dynamics are heavily leaned upon, and Bleuler's general psychological conceptions are frequently and agreeably utilized. Thus we have a fairly adequate statement of what is meant by schizoid and syntonic and the general psychopathological implications of the schizophrenic and oligophrenic dynamic.

In his discussion of the psychological elements of the neuroses he presents the Janet, Adlerian aspects of the inferiority complexes

without a clear recognition of the light thrown upon these by the libido theory.

His chapter on onanism is full of understanding up to a certain point, but the author, in admitting the numerous autoerotic forms, and the importance of their psychological repercussion, as he terms it, stops at a phase which leaves the affective dynamic substitute products inexplicable. He accepts too easily the superficial phimoses, oxyuris, diarrheal, eczema etiologies, seeing in them primary causes, even when having previously emphasized the preponderance of affective causes over purely somatic activities.

In dealing with the psychoanalytic theory Forel admits that Freud's investigations have given an enormous impetus to the comprehension of all types of behavior, but he is distinctly antagonistic to the so-called "principles" which have contributed to this result. In a sense, without recognizing his position somewhat as that of Jung, he deals with the "discoveries" as "symbolic" expressions, denying a reality behind them. He shows a petty cavilling with the "exaggerations" of the disciples.

In spite of all of his acuteness he remains an eclectic opportunist in psychotherapy without a clear recognition of the implications of this shilly-shally attitude from a truly scientific causality standpoint

Curschmann, Hans. Nervenkrankheiten. Die wichtigsten Kapitel für die Praxis. Klinische Lehrkurse der Münchener medizinischen Wochenschrift, Band 2. [J. F. Lehmanns Verlag, München, 1924.]

Curschmann has contributed to the practice of medicine a very helpful and instructive volume. It is so well arranged in form, so clear in its concise statements and in the laying of emphasis at the most practically important points, that its matter is at once available to the practitioner. The latter will find there very definite information when he turns to consult its pages in some diagnostic emergency or will find his interest enlisted in many significant situations which he may have overlooked. For the book though brief is also comprehensive in its review of nervous diseases, and the author stresses these individually as well as collectively as constituting a never-to-be-neglected chapter in all medical interest and practice. On the other hand, it is emphasized that neurology must be bound with a thorough consideration of all other possible internal disorders. The point of view throughout is the broader one of the reaction of the entire organism or personality rather than of exclusive description of a single disease. Curschmann never hesitates to designate a condition as a symptom rather than a final entity in itself. This attitude is especially evident in the discussion of the psychoneuroses, to which the author rightfully attributes the greatest significance in a study of nervous diseases. He has not entirely fulfilled his promise here, we regret to say, in going to the bottom for the explanation of phenomena and therefore in giving therapeutic suggestion. Perhaps he is right that Freud goes entirely too far in his etiological application of the

theory of repression, sexual chiefly, but the unsatisfactoriness of the chapter in which Curschmann promised much turns one back to Freud for effective understanding and help.

Wallin, J. E. Wallace. THE EDUCATION OF HANDICAPPED CHILDREN. [Houghton Mifflin Company, Boston, New York, Chicago, San Francisco. $2.25.]

When it is recalled that the pioneer researches of the elder Seguin and of Bourneville on the therapeutics of the feebleminded are hardly fifty years old, it is a matter of much congratulation to see the mounting series of works by educators dealing with this most serious and important of problems. The matter has passed almost entirely out of the hands of the general medical man; the neurologist, in the narrow sense, is a back number in these matters, while even the psychiatrist finds the Doctors of Philosophy and of Pedagogics outstripping him in their zeal and equipment to deal with the practical issues.

Dr. Wallin, Ph.D., has shown himself a most enthusiastic investigator in these lines ever since the Binet-Simon methods began to spread outside of France, and the present short manual gives evidence of his understanding as well as his capability in dealing with the problems involved. We are quite in accord with the judgment of the publishers' leaflet that tells us that " the book presents an authoritative statement of the technical requirements for the successful organization of special classes for children who are mentally retarded, delinquent, speech defective, crippled, deaf, blind, hard-of-hearing, or semi-sighted. It contains a lucid discussion of the theories, definition, and social consequences of mental deficiency and the ultimate aims of constructive work in behalf of the mentally defective. Four chapters are devoted to the consideration of the special class for mental deficients, its organization, objectives, conditions of successful administration, methods of instruction, curriculum, and the qualifications of the teachers. There is a brief survey of the history of the care and the training of handicapped children in institutions and public schools."

Draper, George. HUMAN CONSTITUTION. A CONSIDERATION OF ITS RELATIONSHIP TO DISEASE. [W. B. Saunders Company, Philadelphia and London.]

That the reviewer's lot is not a happy one has been known for many a decade. Full many a book passes before his critical eye and instantly he knows what to say about it. But on the other hand many a thorny problem lies before him and he is torn by conflicting feelings. Such is the case as Dr. Draper's work is reached for appraisal.

The opening chapter is quite delightful. It oozes in common sense, humanism, and true camaraderie. It is quaint and charming, and one feels that here is a spirit informing and intimate and we are to

be taken into the holy of holies—and then we are hurled against a lot of curves and diagrams, measurements, and then some more measurements, and we emerge dazed and gasping for breath! What is it all about?

It is fully twenty years ago, and we rode up in the elevated train with a disenchanted Aesculapian. He had gone to spend the summer at a mental hospital in New York State to study psychiatry. Among his enthusiasms he had a pocketful of Lombrosian ideas relative to anthropometric data. He went with the idea of measuring everything—but he finally settled down to measuring the human ear. He had believed that Peterson's paper, which was a diluted edition of Lombroso's ideas on stigmata of the human ear, would unlock all the doors to an understanding of human constitution as explanatory of the psychoses. He had measured and sketched and photographed the ears of Cercopithecus and Macacus and other primate relatives of man through the support of Professor Osborne at the Museum, and then repeated almost two thousand fold the operation on all the ears of the inmates of one of our large collections of specimens called a State Hospital, and in our ride uptown on the elevated among the active, busy men also riding in the same cars he had quickly seen all the anomalies he had gathered among the "insane." He was primarily tremendously disillusioned and his twenty years later experience convinced him that "measurements"—like statistics—belonged to that specific category of lies—in that they were superlatively "damned."

Thus we have come, by a circumlocution alone granted to the reviewer, to the conviction that Dr. Draper's measurements are but illusions. They contain that most fatuous of all medical fallacies that structure determines function, instead of that most significant of all biological truths, that function determines structure, or more logically and philosophically stated, that function and structure are correlates of the dynamic energy of life and must be interrelated. Here is the disappointment in the present work.

Ziehen, Th, Die Philosophie der Gegenwart im Selbstdarstellung. [Felix Meiner, Leipzig.]

At times the onlooker upon things medical is struck with the great self-effacement of the followers of Aesculapius. Among the literati a tremendous touting seems the rule. Somewhere within the pages of every literary magazine we find notes concerning the contributors almost approaching the exhibitionism of our dramatic stars seen in the daily press. Of our great medical men even the modest violet blushes in comparison with the efforts at their self-effacement. We almost wish that a department of medical stars propaganda might become the vogue, thus putting to rout the brazen quacks who get all the limelight of publicity. Thus 'tis Coué this and Abrams that for all that the public know, while the real uplifters of human weal and woe get their wreaths some decades or centuries after.

Fortunately a slight shift in the wind is slowly bringing the master minds of medicine into a better present perspective, and the present short notice of the life of Ziehen, now professor of philosophy at Halle, outlines what this really masterly intellect has done in medicine and philosophy. We wish there might be more of this kind of honest, intelligent portrayal of great men and great minds, so that the public would not chase after the superficial quackeries of the incompetent and dishonest capitalizer of human frailties. We dream of the day when a medical " Mercury " will arise to expose the shams of popular medical rascals and to expose their journalistic efforts calculated to fleece the suffering.

Faber, K., Holst, P. F., u. Petrén, K. LAEREBOG I. INTERN MEDICIN. Band III, IV. Gyldendalske Boghandel. [Nordisk Forlag, Copenhagen u. Christiania.]

The JOURNAL has had occasion to commend the first two volumes of this Textbook of Internal Medicine of Swedish, Danish, and Norwegian nationalistic expression. The reviewer has recently had occasion to visit the New York Public Library and was struck by the fact that on the reference shelves surrounding the main reading room could be found monumental general encyclopedic works from nearly all of the great nations. Whereas in former years the Encyclopedia Britannica and Meyers' great German Encyclopedia were almost alone, now extending down the room were English, American, Italian, Spanish, Scandinavian, and other numerous volumed encyclopedias expressive of nationalistic trends. So has it come to be in medicine. To the Ziemsen, Osler, Tice, Nelson, Forscheimer, Brugsch-Krauss, Gilbert, Sergent, and other systems of medicine, the present Scandinavian system has been added.

Volume III is perhaps of less acute interest to our readers. It deals mostly with diseases of the gastrointestinal tract, the disorders of various hollow viscera, the peritoneum, the pancreas, liver, and kidney. But there is one section which is of much value to us—one by Knud Krabbe upon the Endocrinopathies. In fifty pages Dr. Krabbe gives a very vital and succinct description of the outstanding endocrinopathic anomalies of practical importance in therapeutic effort. [A French translation of this excellent monograph has since appeared.]

Volume IV is of more direct interest. It deals mostly with diseases of the nervous system and is written by Drs. Karl Pètrén, G. Bergmark, Friberger, Jacobeus, and Ljungdahl.

The greater portion of the volume is contributed by Professor Karl Petrén of Lund. Professor Petrén here gives us a systematic presentation of methods of examining the nervous system anomalies, and then takes up the neurological syndromies of cerebral origin, spinal cord, and peripheral nerves. Problems of cerebral localization are very exhaustively discussed. These are followed by descriptive analyses of meningeal syndromies, and then by the various cerebral vascular syndrome manifestations. Encephalitis, Brain Abscess,

Tumor, Hydrocephalus, Bulbar Palsies, etc., are all skillfully interpreted in the most modern fashion.

General spinal cord function and dysfunction are treated in a second section, and as special syndromes, tabes, Friedreich's ataxia, hereditary spastic paralysis, amyotrophic lateral sclerosis, progressive muscular atrophies, acute myelitis, disseminated myelitis, compression syndromes, syringomyelia, hematomyelia, subarachnoid hemorrhage, multiple sclerosis, tumor, and spinal syphilis are accurately described. The diseases of the peripheral nerves are also dealt with in a thoroughgoing and satisfactory manner.

Dr. Bergmark of Upsala deals with epilepsy, migraine, chorea acuta and chronica, paralysis agitans, myoclonia, and myasthenia. These chapters are quite fragmentary, and so far as the striatum is concerned it does not enter into the descriptive matter here portrayed.

Similarly in the chapters on the neuroses and psychoneuroses, this system has not yet felt the contaminating influences of the Freudian "pansexual" theories. It rests complacently in the lap of Dubois, Weir Mitchell, and Dejerine. In this it is strictly conventional and safe. These sections lag behind the more wideawake earlier chapters, but all in all this system by Scandinavian authors is a noteworthy production.

Pasqué, Ernest H. The Electro-Chemical Factor in Neurology. [The Atomic Research Association, Detroit, Mich.]

A big book, written by two authors, of which 260 pages are upon the subject noted by the author; the rest of the 600 pages is given over to some New Concepts of Physics by C. S. Page, which will not concern us in this review.

Pasqué would gather from reliable sources a definite and concise picture of electro-biological functions particularly as they are thought to apply to Neurology. This new knowledge, he thinks, will completely evolutionize our now prevalent modes of treating disease. He would utilize Page's concepts in his wider generalizations and thus draw from the "Electron" much of the material of use in his neurological formulations.

He opens up with "Electron Definitions." The human organism has at least forty grams of potassium which emit 80,000 beta particles a second, which, darting backward and forward at the rate of a hundred thousand miles a second, give an idea of what is going on inside of us. No wonder jazz has come to stay and that Irving Berlin should marry the daughter of a "cable" king.

But joking aside, there is contained in this book much useful information about the electrons, atoms, ions, etc.—some interesting material bearing on synaptic junctions and the passage of currents along nerves, viewed solely as physical conductors, but as our joke implies, they have little to do with real life except at the physico-chemical level. As this is really but one of the aspects of life, fascinating though it be, we are questionably grateful to have this hodge-podge summary although one might say it is a sorry mess of undi-

gested material when compared with Bayliss' treatment of the same subjects in his General Physiology.

Bjerre, Andreas. ZUR PSYCHOLOGIE DES MORDES. [Carl Winters, Heidelberg.]

Murder is rarely a pleasing subject to dwell upon. Cain made it unpopular and judges and prison officials have seemed to coöperate in this work of trying to stamp it out. Still, if the metropolitan dailies are not gross falsifiers it still flourishes, and indeed seems to have become, since Mr. Volstaedt-Vollstad-Falstaff (with apologies to H. L. M.) tried to elevate the human race by denying them something, always an impossible procedure, one of the popular pastimes of the post-bellum season.

Dr. Bjerre here would attempt to get at the roots of the difficulty, and not with much conviction from our viewpoint. We have frequently stated in these columns that in our criminalistic literature too much attention is given to the trivial, the obvious, the repertorial, the journalistic, *i.e.,* to the *manifest content., i.e.,* to the camouflage aspects of human behavior and not enough to the *latent content, i.e.,* the unconscious motivations of crime. In this respect the work of Healy, Glück, Adler, and the Mental Hygiene workers in the United States stands out in striking contrast to that done by workers elsewhere in understanding of implicit motivation.

Here is a serious contribution to the casuistics of criminology, but the student of the unconscious will find little of value in it.

Turner, Clair Elsmere. PERSONAL AND COMMUNITY HEALTH. [C. V. Mosby Company, St. Louis.]

This book would deal with the health of the individual and of the community. With the former it deals fairly adequately in that nutrition, exercise, and various infectious disease factors are discussed in their older orthodox relations, and many truths, half truths, and untruths are repeated as from the days of Hippocrates. Presumably by community health is mostly meant epidemic prevention, etc., etc. These are also adequately dealt with. Of community health in the larger sense as freedom from " bunk " and the vastly important issues of propaganda, political intrigue, and larger ethical issues which in realty is what is meant by community health, there is no indication. It is a very sound primer with no larger philosophical program. The readers for whom it is intended would not understand it if it had one. It is really an excellent elementary manual of hygiene—with health in the larger sense it has nothing to do.

Niessl von Mayendorf, E. KRITISCHE STUDIEN ZUR METHODIK DER APHASIELEHRE. [S. Karger, Berlin.]

As some of the readers of this journal may know, this author has devoted much time and thought to the complex problems of aphasia. Further, it may be stated that he is in general a follower of the Wernicke school, the influence of which seems to be undergoing a healthy comeback.

From the purely mechanistic side the problems connected with speech are of undoubted importance. It is chiefly from this angle that this study progresses. Hence he gives us a critical review of most of the recent work along these lines, and one who would be au courant with these aspects can bring himself up to date by reading this very critical study. Thus the work of Henschen, v. Monakow, Moutier, Marie, Pick, Mingazzini, and others is carefully considered. The machine, as such, is thoroughly investigated, the chief attention being devoted to Henschen's studies. Pick's Agrammatismus study comes in for special discussion, and a special chapter, III, is devoted to Mingazzini's ideas, the details of which must be consulted in this monograph No. 27 of the Bonhoeffer series. The author goes through Mingazzini's material with a fine tooth comb. Those interested will get much from the combings. Here he stops. Of Head's newer ideas, with their revolutionary aspects, not a word. Probably the author is hatching something to meet these newer conceptions, which after all are less interested in ideas of localization, of surgical import, valuable though they undoubtedly are and will ever remain to be, and more concerned with the genesis of language as a special mode of behavior.

Barnes, Harry Elmer. PSYCHOLOGY AND HISTORY. [The Century Co., New York.]

It is a delight to have these scattered essays of Professor Barnes brought together in one volume. Herein may be seen wherein the genetic psychology of Stanley Hall has made a revaluation of historical values and how the psychology of the unconscious in the sense of Freud has transvalued a lot of the older historical landmarks.

It has always been characteristic of new developments in man's powers for reconstruction that the new tools have been first appreciated outside of the special cradle of their forging. Thus Wagner was most hated by the musicians and acclaimed by the populace. The priesthood crucified Jesus and passed the buck to Pilate and so the Freudian psychology has been most anathematized by the old line neuropsychiatrists and gained disciples outside of the fossilized orthodox folds of psychology and neurology.

Again we say we appreciate the new lights thrown upon history by a historian able to throw away the old fashioned glasses of authority and repetition of the false.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

Vol. 63 APRIL, 1926 No. 4

The Journal

OF

Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

Original Articles

THE CHARACTER OF MODERN PSYCHIATRY: A SYNTHETIC PRESENTATION OF THE WORK OF PAUL SCHILDER *

By Sam Parker, Stud. Med.
of New York

The taxonomic work of Kraepelin, Bleuler and their contemporaries united the effort to give the psychiatric clinic a plan by which the seemingly inconquerable variety of mental and nervous phenomena might be organized. The scientific foundations for this organization are to be found preëminently in the psychology of Wundt, and, more ultimately, in the materialism and the psychophysical parallelism of natural science. The forms of nervous disease were accepted as substantially the individual expressions of organs, hence the appreciation of them as defects, per se, possessing few signs of any correlation with the organism. That the principle of psychophysical parallelism was applied to the explanation of mental phenomena lay in the presuppositions of materialism. Even the knowledge gained from the study of the glands of internal secretion, although it is a move in the direction of "organismic" biology, is adapted as such in strict accordance with the materialistic principles of direct cause. The scientific approach to the mind was physiological psychology, the full content of the most complex psychic structures as well as the process of perception were reducible to the same formula. Man's experience was built upon a base of perceptions and feelings, his individual reaction on an association of these, beyond which the divers forms of psychic expression were regulated by a quality of apperception. The mind and the soul of

* By request of Editor and in collaboration with Prof. Paul Schilder of Vienna.

man were not only dependent upon nervous matter for their existence; the brain has been considered the substance of their manifestations. A reversal of the influence was inconsiderable.

That there is another way by which to approach the human mind we know from the artists and the experience of our daily life. Indeed, our experience gives the method of intuition its validity. We understand human conduct quite apart from causal principles. The conscious dismissal of understanding from the psychiatric clinic and the analysis of the human mind according to the "disease" or, perhaps, the symptom has led to the confusion and misunderstanding voiced by clinicians in their controversies on the meaning of disease, symptoms, and symptom complex. The method of understanding mental conduct, however, is not only adapted to the needs of humans but, as will appear later, it may be employed to meet the strictest demands of causal science. These possibilities for appreciating human psychology have been realized in more modern times and have been primarily fruitful in extending our knowledge of the springs of human conduct. Philosophically and logically the intuitive or nonscientific method was prepared by the work of Bergson and of Husserl, and clinically adapted in the methods of Jung, Adler, etc. The Freudian psychoanalysis is also a form of understanding the mind in practice, but it lays methodological claim to being causally scientific and has been extended to a principle of normal psychology.

The gap between the intuitive, the psychological method, on the one hand, and the scientific, or physical method on the other, is, however, one of principle; a difference which seems incapable of solution except in the fusion to a higher unity. The attempt to bridge this gap has been going on in many branches of science and has resulted in the biological approach to natural phenomena. If a mind without a physical substratum is unthinkable then, from the biological point of view, a realm of psychic phenomena is illogical which does not express itself by means of nervous mechanisms. The organic apparatus has developed to meet the needs of biological forces and the psyche, as an integral part of organic life, discloses a similar structural organization. As will be discussed later, the psyche may be considered even more potently a biological agent directing the reactive conduct of the organism and, conversely to the notion of materialism, itself being reflected in the structure of the nervous matter. In psychiatry one of the most diligent exponents of the biological position has been Professor Schilder in Vienna, and we may follow the thread of modern method more concretely in some of the principles formulated and carried to their ultimate conclusions by him.

The stream of experience is not exhausted in an enumeration of the perceptions or sensations. It is, first of all, the experience of an ego, an individual. By the ego is meant the experiencing core of the individual, the individual quality; and psychology is the study of this ego in its various expressions in sensation, perception, thinking, etc. Conduct or experience are the result of a reaction of the ego to objects, whether they be such of the external world or of the mind, and in each reaction the whole ego, the whole personality is reflected.

The descriptive psychology or phenomenology developed by Husserl and Scheler and transposed to psychopathology by Jaspers [1] has shown that the realms of sensation, thinking, etc., also possess a definite structure. It is to these structures as objects that the ego directs itself in the act. The act is simply the attention to an object, the experience. Quite apart from any sensation the act is the radiation from an ego to an object as such. The sensations of light and darkness, color, etc., which I have of a pencil compose the content of the pencil, but the primary descriptive factum is the appearance of the pencil as such to my ego. The only psychological datum is the experience of the pencil as an object; the rest consists of physical processes. Beyond the questions of epistemology as to the metaphysical reality of the object, it must be considered that the object appears first as such to the ego which perceives it, perhaps in one quality, perhaps in another, *i.e.*, either desiring, acting or imagining, etc. But the object appears also in any number of forms though still retaining its character as the same object. For example, a box from any one of six sides, or as a complex of lines and angles and yet a box. The content of such a radiation, such an act of the ego (the "Ich" of the Germans) toward an object is then made up in the sensations, images, thoughts, etc. In short, the primary process of perception consists of three categories; the ego which perceives and in so acting turns to the object which appears. The contents of the act are the sensations which occur in the body. The body thus stands as one sphere between the personality and the world of the object. It belongs, nevertheless, to the sphere of the ego although it may itself be the object of the ego. In the sensations it represents, so to speak, the personality, and perceptions may be structurally differentiated into those further from the ego, closer to the external world, and those nearer the ego and further from the world. The act itself also possesses regular characteristics. It is of a different quality depending upon whether it be an act of

[1] Jaspers, Karl. Allgemeine Psychopathologie. 2d ed, 1920, Berlin, Julius Springer. The literature on Phenomenology will be found here.

willing, wishing, imagining, etc. Or it consists of a different material in relation to the particular aspect of one and the same object. These must not be confused although occasionally the variation in quality may cause a variation of the act material, *i.e.*, a change in willing or wishing can change the manner in which an object appears.

The Ego is irreducibly a part of every act as the experiencing agent. But it can also know of its experience in an act. This does not mean that the subject becomes its own object but simply that the ego is then no longer in the act, let us say, of thinking, but in that of knowing. When, in an act of perception, the material of the act is changed, it is nevertheless always the same Ego which perceives the object, follows it in all its manifestations. But there are cases in psychopathology in which the object world (our reality) remains unchanged but the ego seems to have undergone transformation. It is in this field that the form and consciousness of its modifications may best be studied.

Schilder subjected the conditions of depersonalization, double consciousness and similar forms of so-called split personality to a careful phenomenological analysis.[2] In the thesis that the ego is an irreducible psychic form of the organism the splitting of the personality can be nothing actually altering the psychic elements of this ego, nor such elements of the personality. The change is simply one of contradiction between the experience of the central ego and the experiencing individual. "The self appears soulless because it does not flow undivided from the ego. It is not enough that sensations, feelings, images, thoughts be immanent to the stream of consciousness, indeed it is not enough that these be grasped by the central ego. In the grasping of content all the actual tendencies of the ego must be uncontradictorily unified." The phenomenology of ego experience shows that in its adjustment to objects given, so to speak, in the immediate foreground of an act, the ego at the same time experiences tendencies toward the background of the experience or toward objects of a different sort. But the experience is never plural in nature. On the contrary the ego tends to the unification of its acts and what we know as depersonalization is but the incompatible situation noted above; the ego cannot enter into the act of experiencing and the act of knowing of its experience at one and the same time. Neither is it divisible, for it is contained entire in each act. The result is that the activity of the individual appears strange, external, and automatic to the ego, a condition not unknown

[2] Schilder, Paul. Selbstbewusstsein und Persönlichkeitsbewusstsein. 1914, Berlin, Springer.

to normal life. As soon as one attempts the observation of otherwise intact conduct it immediately threatens to fail, and the ultimate in accurate experience is "to do it without thinking." In this direction it is also diametric to the experiences of the ecstatic and possessed, which may be summarily characterized as commanding all the actual tendencies of the ego to an intensified degree. The ego is thus found to be within every act and its modifications consist only in being unified to a greater or less degree.

Jasper's statement that the realm of perception is distinctly different from that of imagination was subjected by Schilder to the test of experiment.[3] The net result was that, in respect to the psychological content, the image may be objective to the ego in essentially the same sense as perceptions. Even distinct signs of the process of sensation were noted which possessed the usual relation to forms of perception, thus corroborating the notion of Lipps that the image has the tendency to become perception, a notion which is of philosophical importance. The phenomenological data, the morphology, of experience are thus of the same principle whether the ego turn to the external world or to the structures of the mind. The subjective structures are not only meant for objects, but they even tend to reach the world of objective reality (psychologically speaking). In this bare sketch we have a factual basis for describing the content of psychological experience. We are able to arrive at the static structure of the act. But psychic life is not a single act nor a succession of such constellations. It is a phenomenon embedded in time, a stream of experience. Bergson even characterizes it as "pure duration."

Psychoanalysis has given psychiatry a method of understanding the mind in its fluid state but for the present we must note how the originally timeless nature of phenomenological data may be thus adapted. Here we must repeat that the ego is constant as long as existence and not only present in every moment of experience but itself experienced. The particular nature of an act is, however, determined by what the ego has experienced in the past, and the past is not only definitive for the act radiating from an ego to an object in the present but it is itself illuminated, given meaning by what takes place. Not alone the ego gives unvarying and individual personal color to an experience, but the peculiarly individual past out of which it has sprung defines its quality too. This past need not be thought of as some apsychic, subconscious influence. It con-

[3] Schilder, Paul. Wahn und Erkenntnis. 1918, Berlin, Springer.

stitutes the broad background upon which an object is at present brought to the fore.

But the psyche lives not only in time; it is directed; it has purpose. The concept of purpose is altogether a derivative of mental life and when we say that the ego radiates acts to objects we mean that the ego purposes an object. That this purpose in psychic life is ever present is not at all disturbed by the influence of the past for, although the past may define the material of an act it does not change the purposeful nature of it. It was stated above that the ego means objects in the act of imagining, thinking, etc., as well as in the external world. This places us in the midst of a biological point of view and is of importance in evaluating the pathological mind. For we see that psychic structures are quite as accurately aligned to the needs of the organism in a world of objects as its organic ones. The biological point of view predominates in fruitful quarters of the psychiatric clinic, for example, in the work of the Tübingen school from which we have the work of Kretschmer, Hoffmann, etc., on the manifest alterations of the mind in correlation to the body. Schilder attacks the problem of the organism from the other side, seeking to establish the physical organism in the service of the spirit. The latter is naturally also under a certain influence of the former, acting in correlation with the constitution.

Following the work of Kraepelin and the developments of Bleuler psychiatrists have paid much attention to the problem of schizophrenia. Quite apart from its clinical aspect, the psychology of schizophrenia has been attempted, and these principles as well as the meaning of the biological point of view may be well traced in the studies Schilder has produced in this field. To begin with, the factor of irrationality cannot be primarily considered as a peculiarity of mental disease since such factors undoubtedly influence the highest forms of thought in a salutary way. That such highly valuable concepts may appear in apparently totally schizophrenic minds has been satisfactorily shown by history (Strindberg, van Gogh). The difference between the products of the positively diseased and the healthy cannot, then, be a subjective one since the most normal minds probably experience the same unification of the ego, the same sense of totality and completeness in a production as mentally diseased. A descriptive analysis of a more typical and suitable case leads to the conclusion that the diseased mind shows itself in its failure to achieve reality. All the paraphernalia of the mind are put into operation, but instead of arriving at a point of action the process exhausts itself in a hallucination, symbols, dreams,

etc. Schizophrenic reality is not the reality of the objective world, but a dream world, a scene in which the various objects are called up by the mind, formed at will, and experienced without the slightest activity.

To the understanding of how the object may thus be transformed, it may be recalled that the affective constellation of an individual not only defines the objects toward which the organism directs itself but also the manner in which these objects appear. The already mentioned experiments of Schilder show that images and perceptions may so merge that they become, in principle, identical. Psychologists have shown that the intensity of attention also changes the apparent nature of an object, and the phenomenological analysis of the act given above shows (Husserl) that changes in the quality of the act (whether it be one of willing, desiring, etc.) at the same time change the material of the act (the particular manifestation of the object). As already stated, however, the quality of an act, the affective constituent, is not a voluntary one but a product of the past experience of the ego and the affective history. In this sense not only the attitude of the ego toward an object but the very manifestation of this object are determined by the past history of the individual. That which then differentiates real thought from phantasy, successful conduct from dementia, is its emotionally essential capacity for comprehending reality and not distorting it. The phenomenological analysis is based upon the premise that thinking, willing, and the like are directed toward this reality. The unreal character of schizophrenic thought and conduct is so, ultimately because of a diseased organism. The prevailing conception of schizophrenia as an organic disease may thus be biologically adapted in so displacing the tendencies of the organism that the mind no longer reaches the world of objective reality.

Schizophrenic thought is affective; the products of the mind are at the mercy of a horde of instincts, desires, and impulses. The tendency of such mental activity is to become unclear, general, and thus really impracticable for use. This is, in normal life, shown to us by the concepts in use in social life, science, and the like. The practicability of concepts depends upon their sharp alignment with the real world and their comparative stability. That which deepens our understanding of concepts is that we are able at all times to adjust the concept to the ever growing number of immediately real phenomena. At that point when desire or intensity of feeling begin to weigh upon an experience the impulse willfully rushes to the act without having taken cognizance of the real intermediate factors.

The analysis of such concepts shows them to be highly general and not sharply defined. The comparison with primitive thought is understandable, a comparison probed by Freud and Jung, who were able to show a real descriptive similarity between the notions of schizophrenia and the conceptions of primitive peoples. These studies were deepened by those of Schilder, who showed[4] that magic, considered by the ethnologists as altogether of great importance in the life of primitive peoples, reappears again in a large proportion of schizophrenics and paranoics. Paranoia chronica is, however, in the Kraepelin system, related to schizophrenia in the sense that they are both organic dementias. Now, the magic of the archaic mind is the willful influence of real objects, this influence being directed against those objects possessing a comparatively great affective importance. The primitive experiences the phenomena in nature, which possess great meaning for him, as the direct causal result of his will and his feeling. Such a psychic orientation toward the things of the world, as we have seen, leads in mentally diseased to symbolical, unreal, vague structures. It is found, on the one hand, that the world of the primitive mind becomes less well defined and feasible for action the more completely it is influenced by the forms of magic, and, on the other, that magic-like forces will be noticeable in those mental diseases in which the mentally dreamy and affective states of schizophrenia are present. These studies are intended only as comparative and their results must not be misinterpreted to mean that schizophrenia is a direct regression to a state analogous to that of primitive man; or that folk psychology can explain schizophrenia. It is sufficient for the purposes to have seen that, although with both primitive peoples and psychotics cognitive interests are present, their real value is displaced under circumstances permitting the overflow of the emotions. The more ultimate reasons for this overflow in psychotics may be left to the biological discussion of the influence of the soma on the mind (see later). The principal comparison is to be followed into greater detail, Schilder having disclosed similarities in respect to the conception of the rôle and importance of sex, the forms of animism, etc. Sexual life carries with it a great force of feeling as a consequence of which it must appear as a particularly potent field of magic. As a part of the whole striving of the individual, sexual feelings will also determine the relations of the individual to the object. The schizophrenic as well as primitive man sees great mag-

[4] Wahn und Erkenntnis.

ical powers in sexuality, but they fuse this magic power with a yet higher one which transforms the whole picture of the world, which controls birth and formation everywhere. It may not be amiss to note, *àpropos* of the whole question, that the history of the mind is the history of the increase in the cognitive appreciation of the world as over against a more " primitive " attitude of feeling.

Our discussion of some descriptive characteristics of schizophrenic thought is necessarily of outline form. The phenomenological treatment has, nevertheless, been of unusual progress particularly in such states; and such studies as Schilder's are actually pieces of the most precise psychological delicacy. Yet the structural analyses of phenomenology and the ethnological method (historical) exhaust by no means the fruits of modern psychiatry or the magnitude of schizophrenic psychology. We will find the problem of the organic dementias approachable not only from the static side but also from the point of a dynamic psychology. Indeed such a psychology has not a little proved itself on this problem and we can trace the progress made in many of its own concepts during the adjustment. This will, at the same time, bring us nearer to the organic problems and to a deeper analysis of the meaning of biology in its scientific use.

Phenomenology gives us a description of psychic constellations at rest. It is a structurally static analysis of a cross-section of the stream of experience. The analysis of even a static sagittal section of this flowing life has been of great difficulty. This is sufficiently illustrated by the fact that any variation of introspective psychology, in order to gain a view of the experience, must bring it to rest. The cardinal characteristic of living experience is, however, its existence in, and appreciation of time, and any psychology approaching the nucleus of experience approaches a dynamic formulation. We have seen that a phenomenology of experience can include the nature of the past, but this does not transform the method to a functional one.

In continuation of his contributions to the problem of the dementias, Schilder was fully conscious of this and stated the situation most competently in his introduction to " Seele und Leben " (p. 1). " It is not enough only to observe the resting structures of the soul, to dissect and describe them, order and classify. It . . . is a necessary prerequisite but such work is incomplete and unsatisfactory. For it is of the essence of the psyche that it proceeds in time, that it has a past and strives into the future. Resting psychic life is but an abstraction and that which is at rest takes on meaning

only in the stream of becoming. . . . Descriptive psychology must be completed by psychogenetic research. . . ."[5]

The experience of time is an irreducible psychic quantity, as, for example, the direct experience of the relation between willing and acting. Here is not only the experience of purpose as between the mind and the object but the content of time as adhering only to that experience and not to objects which are, psychologically, timeless. This may also be recognized in its consequences in the primitive and diseased mind. The phenomenon as such, in its quality, is graspable in the phenomenological sense, and Jaspers and others have developed it on this plane to a dualistic platform of psychic understanding in which understandable relations (verständliche Zusammenhänge) and causal relations are completely separated. This position precludes the possibility of its adaptation to the forms of natural science, although in a sense, the essence of its descriptive psychology remains biological. It does not, however, give complete satisfaction to the biological postulate, since in no way can one develop the very apparent relations between the body and the mind from the dualistic position. It becomes necessary to link the developments to the principles of natural science.

In the external world and in the world of nature time is not experienced but postulated, and studied by means of the principle of causality in the object. As will be discussed more broadly later, the use of this principle in science or in the mind has nothing to do with the qualities of objects but simply with their consequence. In this sense the qualitative data produced by phenomenology are not in the least influenced by a causal analysis. The difference between causality in nature and causality in the mind, however, is that the latter is directly experienced. It is primary; so that it becomes easy to understand the adaptation of a scientific principle original in psychic life. A dynamic psychology, a method comprehending the element of time in experience, stands upon the principle of cause, and is, in essence, a scientific method. In this respect it is the invaluable service of Freudian psychoanalysis to have become a dynamic psychology which serves as a normative basis for the study of psychic processes, while, at the same time, comprehending the relations of the mind to biological changes. Essentially, psychoanalysis was a form of Understanding Psychology, but it has come also to lay claim to full recognition as a scientific method. The crux of natural science is, after all, a strict adherence to causality and, just as physical science

[5] Schilder, Paul. Seele und Leben. 1923, Berlin, Springer.

approaches but a part of the world for the study of consequences, so also does psychoanalysis pass up the ultimate quality of mental structure for the study of effects and changes.

At this point we may resume the development of the problem of schizophrenia and the related paranoia (Paraphrenia, Kraepelin). In his papers and monographs on the subjects here related Schilder has not only widened the psychological understanding of schizophrenia but he has also given qualitative meaning, psychically full play, to many of the most important psychoanalytic concepts. First of all, the genetic orientation of psychoanalysis does full justice to the structurally postulated past of Schilder's notions. But beyond this, Freudian analysis is thoroughly biologic in its concepts of conversion and repression, since these describe the eventual effects of the past not only in psychic form but also in their influence on the organism (conversion). But what of the changes in mental phenomena as a result of organic lesion or dysfunction? To this question it may be said that psychoanalysis has shown that schizophrenic and dream confabulations have meaning and that they take place upon another plane of experience (infantilism, regression). Schilder's observations early led him to the conclusion that the personality expresses itself under all circumstances as long as life, so that, in a manner of speaking, influences, be they psychic or physical, only displace the ego to the other plane. This process is seen typically in alcohol or alkaloid poisoning, under the influence of which the personality has not been transformed but transposed. Now, modern psychiatrists almost unanimously consider the dementias as organic processes. This does not preclude their statement in psychological terms, however. To comprehend the process Schilder uses the term "displacement of the psychic plane" (psychische Niveauänderung),[6] by which it is to be understood that organic influences (among them the nervous or constitutional agent causing an organic dementia) can only displace but not disrupt the essentially unified modus of the expression of the personality. This is essentially what psychoanalysis means with the psychic concept of displacement of the libido. Mental life expresses itself out of its own past and in its own terms but, because of a change in the nature and viability of the physical medium, in another, more primitive, infantile sphere. This position indicates in the direction of a prevailing spiritual monism as the single principle under which natural phenomena may be subsumed.

In more recent times the attempts to comprehend the demented

[6] Schilder, Paul. Ueber die kausale Bedeutung des durch psychoanalyse gewonnenen Materiales. Wiener kl. Woch., 1921, No. 29.

mind in its entirety have been many. Stransky formulated the notion of intrapsychic ataxia, Bleuler defined a primary lesion in association, Jung postulated a psychogenesis to which the physical symptoms of the disease were secondary, although the authors in general hold to a primary somatic genesis. Yet Jung's essential psychological method is taken up by Schilder and deepened. In principle it is the position that the schizophrenic mind is a regression to a more primitive infantile, narcistic state, which, for Schilder, is but the ever persistent personality in another, lower plane of expression. Schilder's studies approach the fundamental structure of concepts and thoughts and their changes as shown by the pathologic mind.[7] Normal thought develops, just as the image from an unclear and general to a clear and sharply defined structure. This process is an associative one in which factually and affectively related images and notions are mixed. The more elementary and distant the images are, the more direct is their dependence upon the emotional influence; so that undeveloped images often possess a symbol-like appearance. A thought passes through the same type of development in which images and symbol-like structures play a great part.[8] A thought develops upon a basis of images, but the perceptual element becomes less important as the thought develops towards sharpness and meaning. An experience which is full of meaning is thus poor in perceptual quality and simple as, *e.g.,* word images. The ultimate source of such a process is a single, unified act of will. In the language of phenomenology, a single intention directed toward an objective relationship. The origin of a thought process is in the instinctive tendencies of the organism; these are the impulses which form and transform the pictures in the process of development and normally pass over them in their attention to the ultimate object. The final clarity of normal thought shines upon a dark background of mixed ideas, images, and tendencies, the matrix from which thought arises. For these formulations Schilder introduced the concept "sphere of consciousness" (die Sphäre) into psychopathology. The sphere, James' fringe, is the base of experience of any kind; it is the foundation from which the most conscious as well as the shadier, more unclear experiences spring, these being but various stages of development out of the periphery of consciousness. From the positions indicated in phenomenology, and from the discussion of the importance of the past in experience, we understand that that which is psychically given

[7] Seele und Leben. Section on Concepts.

[8] The basic principles are developed in "Ueber Gedankenentwickelung." Zeitsch. f. die ges. Neurol. und Psychol., 1920, Vol. 59.

is given in consciousness. The past appears in consciousness in the peripheral, unclear structures of the sphere. The instincts, the given impulses pass, so to speak, through the horde of images and experiences from the past which are massed in the sphere, and on the way toward the present object strike up a resonance in those structures factually and affectively associated with itself. Those which are more closely connected with the object intended are more clearly defined and assimilated; those less so are dropped in the passage. The process as such, the system, is defined also by the psychoanalytic system Ubw. (unconscious). But thought which is unconscious or apsychic is not given in the actual psychic process. Freud himself has designated "unconscious" and "conscious" as only the "working methods" of psychic apparatus; so that the sphere is an entirely legitimate definition of the system Ubw. as the psychic quality of that system, the conscious phase of an impulse.

Now, the same formulation applies to whole concepts. A concept possesses structurally analyzable parts and its prime psychological characteristic is that it is timeless, objective, as it were, and thus, like the objects of perception, a crystallization point of action. "Concepts arise when intentions are directed toward a conceptual basis. These intentions are biologically founded; they arise from the emotional life, the affectivity. . . . They (concepts) are motionless and fixed because they add an ideal goal of action to the real one. They correspond to the organization, to the framework of action and the emotional life. It is an extension of the real world to a possible one in so far as it may be an object of conduct. . . ."[9] That which prepares the concept psychologically for action is the experience of its meaning, and since such an experience is dependent upon the intensity and directness of an impulse any deflection by or merger with other instincts is a deflection from the sharpness and meaning of the concept and its value for action. If we recall that the images preparatory to the final thought or concept are peculiarly susceptible to affective (wish) transformation into symbol-like structures with the spheres of other instincts, we will understand that premature thought must be based upon a world produced by phantasy. Any action occurring upon this basis takes only an imaginary, unreal world into consideration. That which may, first of all, preclude a concept from coming to full fruition is a disturbance in the impulses which bear it. A dissociation, a regressive disunion of the instincts, will preclude any united progress through the tangent

[9] Seele und Leben.

spheres of them all to an unified, objective concept. The mental and conceptual products of such primitive instincts may thus also be considered as infantile or regressive and incompatible with the real world.

All these formulations for the psychology of thinking are illustrated by the mind of the demented. "The psychology of schizophrenia is, in great part, the psychology of primary thought. . . ." Following the considerations that the instinctive life of the schizophrenic is a disrupted, not objectively directed one, it is clear that his conceptual means of comprehending the world, and this world itself, must be vague and dream-like, in a state wholly at the mercy of these impulses. First one, then another orientation is remarkable, and the so-called intrapsychic ataxia, the "split personality," may perhaps be derived from such a ceaseless displacement of one impulse by another, added to which is the fact that every such regressive dementia carries with it parts of a real world to which it once belonged. It must also be stated that the concept of the sphere and the process by which concepts are developed is calculated to give a psychological meaning to the psychoanalytic concept of identification. The sphere is a hierarchy of differentiations which become more and more single the further the process develops away from the periphery toward the center. The preliminary stages of thought in schizophrenia show, in general, categories of thought such as authority (God, father, brother, etc.), procreation (nature, sex, etc.), right and left, good and evil, and others, in which the parts may displace each other or merge with the parts of other categories.

This particular mechanism may be developed in greater detail upon the basis of further peculiarities of schizophrenic experience. Fully developed normal thought radiates from a sharply defined ego to an equally well defined world of objects. Between these two categories is the body, definitely separated from both but situated nearer the ego. The body is at once the subject of the will and the point of contact with the world. This world is experienced not only in the act of the ego but has its content in the sensations of the body. Although, in normally regulated experience, this differentiation is usually well guarded; there are many gradations of experience in which the disparity of the world and the body becomes less clear. In the tactile perception of an object, for example, the difference is still preserved, but it becomes immediately less clear when the tactile sensation becomes one of great pain. In such a case the object and the sensation (world and body) begin to run together in experience. This is precisely the process which appears in schizophrenia. All of

sensation has a tendency to merge and thus to become less differentiated from the world. Now, experience, as has been continually emphasized, flows from an instinctive tendency of the ego to an object. It is affective. Normal experience has shown us that when this tendency is directed more toward the sensual, affective (body) side of experience than to the object (world) side of it, the two categories tended to approach each other and the world to merge with the body. We have seen how the preliminary forms of thought in schizophrenia are at the mercy of impulses which do not reach the objective world but more primitive, undifferentiated, affectively distorted forms. Thus at one time portions of schizophrenic experience may appear in the external world, and at another the world has shrunk and parts of it are in the body. Thus the peripheral, indistinct experience of the demented mind erects a phantastic world by means of disrupted instincts, and these instincts produce the phenomena we know as identification, projection, and appersonization by a shuffling and rearrangement of the sphere. This is the psychological content of well constructed psychoanalytic terms which comprehend the dislocation of experience from its objects to satisfaction of the instincts in the realm of the body.

The Freudian concept of narcism comprehends such a situation in its entirety, and a closer analysis of this condition in schizophrenia immediately leads to a consideration of many symptoms which may be illuminated by this problem. It is altogether considerable that the healthy mind proceeds largely without the symptoms we know as pathologic because of an undisputed unity of experience. The successful passage of an impulse through the structure of the sphere to an object is precisely the mark of this undivided attention to an object; all the possibilities of symptoms have been absorbed in the central act. The dysfunction of the emotional life, sexuality, the affectivity, produces an immediate dissolution of the unity of the normal mind which may change in degree to a quasi final state in the narcism of schizophrenia. The primitive instincts which shoot up at this stage produce, then, the symptoms which we know, symptoms which must illustrate and be illuminated by the regressive condition itself. We have already seen how the systems of identification are understandable in this sense, but there are others.

In an earlier paper Schilder had shown, on the basis of sufficient clinical material, that hallucinations possess all the formal characters of perceptions and may thus become the objects of action.[10] An

[10] Ueber Halluzinationen. Zeitsch. f. d. ges. Neurol. und Psych., 1920, Vol. 53.

analysis of their content and the mechanism of projection makes them understandable as a product of a pathological affectivity. "The hallucination is an autonomous, biological partial instinct," which means that the more primitive impulse arising during regression directs itself biologically toward the object corresponding to its own differentiation—the hallucination. From the above discussion this becomes even clearer when, as Schilder notes in later studies on schizophrenia, we realize that a hallucination is a clearer form of the typically primitive magic transformation of the external world. It is an expression of a nebulous demarcation between body and world. Because the limits between external and internal world have become demolished, the activity does not reach an external world but appears simply as a part of the personality projected. From this point of view, and with the adaptation of psychologic studies by Seashore, Perky, and others, Schilder arrives at an appreciable, even if sketchy, psychology of this symptom. From the same basis of a psychological adaptation of psychoanalysis, from the point of view of a narcism, the cases of depersonalization discussed above and hypochondria may be understood as reactive mechanisms of primitive instincts. Narcism is self-love, the resolution of impulses, of affectivity in the personality itself. Cases of depersonalization as well as hypochondriac patients show a certain similar willful contamination of the external world with the body. The organic object of hypochondria is projected, so to speak, into the outer world by the process of observation, but it is not hallucinated; so that hypochondria may be looked upon, quasi, as a prologue to hallucination.

It is, of course, an open question as to whether the protean immensity of schizophrenic processes may at all be subsumed under any closed system or under the formulations here indicated. We have not considered the manic-depressive and amentia symptom complexes which appear so often. The notions by which Schilder has comprehended the psychology of the dementias may nevertheless be recapitulated. The regression of the instincts in the psychoanalytic sense is consequent to a primary organic undermining of the organism. This physical attack is either directly or indirectly via the hormonal-vegetative system effected in the cortex. Consequent to the dissolution of the affective unity of the individual, the conceptual basis becomes enormously augmented, nebulous; the development of concepts breaks off in the sphere at a premature imaginary stage which is directly under the influence of the emotions and transformed by them into a symbol-like world of the phantasy. This is the world of the wish, and the action in it is analogous to magic. Conduct does

not meet the requirements of the objective world because the goals toward which the primitive impulses are directed are primarily not of the real world. Conduct is, however, altogether limited because the broad and undefined nature of the sphere offers no fully crystallized object to equally dissociated impulses. The result of this peripheral, narcistic experience is that the body and the world become indistinguishable; the stage of primary narcism. The frequent outbursts of sadistic, anal, oral erotic impulses are, then, also consequent to a splitting up of the normally collected primitive instincts.

It must be emphasized that Schilder represents the basic position of Freudian psychoanalysis on the genesis and content of schizophrenia with the difference that certain of the concepts have been brought into closer relation with the evident organic and biologic changes observed. According to the classically advanced principle of psychoanalysis, the psychosis must not only be characterized psychologically, but there must be an evident psychogenesis, which precipitates the regression and dissolution of the personality. In respect to this question psychiatry has considered the predisposing, dispositional moments as at best secondary to the indisposing, constitutional factors. This position has a shady background of consistent materialism, however, which must be modified in the face of material showing the apparent influence of psychically precipitating factors. Schilder's own position adapts the manifest values presented. Although the psychosis may be initiated by psychic experiences, schizophrenia proceeds according to the regulations set by organic dysfunction as outlined above. The psychogenesis of the neurosis, the production of affective disturbance by strong experience, is, however, more directly comprehensible. The two instincts, of the ego and sex, classically postulated by psychoanalysis, appear to be ultimately very closely connected. At an earlier date Jung had also insisted upon a primary psychic energy and Adler has laid particular weight upon the ego. By a closer analysis of the concept of narcism in its relation to ego instincts, and particularly by the recognition of mechanisms (grasping, possession, etc.) which are objectively related to both the sphere of the ego and the sex, Schilder acknowledges a single affective source from which both types of instincts spring. The sexual impulses possess the descriptive characteristic not only of procreation, etc., but also of might and power (force, conquest, grasping), and egoistic impulses contain elements of sex (incorporation, increase) as well as power. As has been explained above, the individual presents an united front to the objective world and any act contains the whole organism, all its partial impulses, unified. There

is no man of might, no "jealous cat" who has not at the same time collected all his or her instincts in the experience. The ethical structures which man experiences are the values and relations of the objective world, and the striving toward the goals set by an ideal of the ego is the striving toward a comprehension and conquest of reality in these ethical forms. "All the conflicts of human life can be comprehended as difficulties in the appreciation of objective, erotic, or nonerotic goals." The conflict becomes a maladjustment between the objective structure of reality as represented by the demands of the ideal ego and the pressure of the partial instincts. The psychogenesis of the neurosis begins at that moment when the individual begins to fail in meeting the requirements of the real world, turns not toward objective structures but to a world built up by more primitive instincts in which the ideal ego is satisfied.

Schilder's contributions to psychoanalysis and his psychiatric adaptation of analytic methods and psychology to the elucidation of clinical problems is organized in his "Plan for a Psychiatry on a Psychoanalytic Basis." [11] At an earlier date he had formulated preliminary points of view for a general psychiatry which he had phenomenological principles and the mechanisms of the sphere as a point of departure.[12] The present volume is an augmentation, for it adapts psychoanalytic methods to the psychological understanding of many clinical groups, particularly to the elucidation of neuropathologic problems, as well as to the neuroses and schizophrenia. The modus of psychophysiological relations has long been under the influence of a parallelism derived from a strictly materialistic monism. That modern psychiatry has delivered itself largely from this point of view, and how it conceives the physicopsychic relations, will be considered immediately. The situation reflected in these chapters is that psychoanalysis is able in most instances to give at least a preliminary psychological account of clinical symptom complexes. This account proceeds from a few psychic principles which may be manifested first in one form, then in another, depending upon the physical means offered by a biological change in the organism. From this point of view, it is a novel but not inept circumstance to find chapters in which Amentia, Aphasia, and Agnosia are considered under one head, or such in which general paresis finds a psychobiologic statement.

[11] Schilder, Paul. Entwurf zu einer Psychiatrie auf psychoanalytischer Grundlage. 1925, Vienna Int. Psych. Verlag. In course of translation for the Monograph Series.

[12] Schilder, Paul. Gesichtspunkte zu einer allgemeinen Psychiatrie. Archiv. f. Psych., 1918, Vol. 59.

The search for a common denominator of psychic and nervous disturbances is not new, and it is quite as legitimate, depending upon the emphasis, to proceed from a scientifically grounded psychology, as it was for Wernicke, for example, to explain the clinical pictures of psychoses and neuroses on the basis of his classic scheme of aphasia.

That such a method is not only legitimate but logically and practically fruitful may be seen in the modern programs of medical psychology. In 1922 Kretschmer published his "Medizinische Psychologie," a very small book, but a bold and straightforward exploitation of biological methods for psychology on the basis of a spiritual monism. This platform is developed and deepened in Schilder's "Medizinische Psychologie" published in 1924. The data of modern psychological and clinical research have shown the mind to be quite as much an instrument in the comprehension of the world as the organic structures. Indeed, the mind is also an organic structure, not built up of others but meeting the needs of the organism with and by means of the physical organs. "The attempt is here made to fuse phenomenology, psychoanalysis, experimental psychology, and cerebral pathology in an unified whole. One may call this eclecticism, but each of these methods has offered us factual truths, and factual truths, although of different spheres and points of view, must ultimately hang together and be susceptible of union." The introductory statement to the "Medizinische Psychologie" puts the platform of modern psychiatry. Beyond analysis it seeks the synthesis, for only so can science approach an insight into the essentially synthetic character of the individual. It is for this reason, too, that the psychology here mapped out possesses a more human, spirited character than the rigorously detailed concepts we have heard before. The sharp differences between the normal and abnormal, between health and disease, fade here as they are beginning to fade in somatic medicine, and we learn that the mentally diseased and mentally healthy are but different planes upon which the ever-striving personality seeks to meet reality. This restates a previous formulation of Schilder's that the normal mind contains the whole psychic warehouse from which the psychosis takes its material, bringing to the surface only that already deposited in the organism. From the psychological analysis of thoughts and the method of their development we can see how the earlier notions of Schelling and Nietzsche that a tinge of insanity goes into the best of human

production, and that health is but the objective conquest of madness,[13] takes on a psychologic acuteness.[14]

As regards the methodology of modern psychiatry the review of the questions dealt with in one of the chapters of the "Medizinische Psychologie," may be not irrelevant. We choose the chapter on action and speech. For considering the question of psychophysical relations, localization centers and their prevailing appreciation no chapter could be more apt. For how are the contents and purposes of psychic processes better represented than their motor consequences? This will, at the same time, lead us over into the philosophical preconceptions upon which these and similar methods are based. An action is a biological process in which an individual directs his energies toward an object, hereby innervating divers sets of motor organs. Speech may be viewed from the same angle, and apraxia and the aphasias in all their various forms are still actions and forms of speech albeit in incomplete form. Now, an action or movement requires for its execution, for its origin altogether, a plan of movement. Martin's studies showed that the beginning of movement occurs with the appearance of optical and kinesthetic images. Upon the basis of the work of Head, Liepmann, Pick, and Schilder it is probable that these images are the parts of a normally well defined Schema. Originally considering the localization of tactile sensations, Head suggested that the individual possesses a sort of topographic arrangement of his body in the mind and that the localization of the sensations were effected by a relation of the sensation to such a scheme. In the work of Pick and of Schilder[15] this idea has been developed by studies in the pathology of action (Apraxia) and Schilder has postulated a body diagram (Körperschema) by means of which normal action or movement presuppose an intact consciousness of the elements of the body diagram. There is no more chaos in the appreciation of sensations than in any other form of psychic experience. As a matter of fact, the results of these studies lead to the legitimate assumption that just as thoughts and concepts stand in relation to the general sphere, so is there a matrix, a diagram into which sensations of the body are ordered and then relayed to their accurately corresponding motor expressions. It appears that the body diagram has optical, tactile, and kinesthetic

[13] In this respect the artistic appreciation of Nietzsche by a literary critic is of interest. Zweig, Stephan. Der Kampf mit dem Daemon. 3d essay, Nietzsche. 1925, München, Insel Verlag.

[14] Loc. cit., No. 12.

[15] Schilder, Paul. Das Körperschema, ein Beitrag zur Lehre vom Bewusstsein des eigenen Körpers. 1923, Berlin, Julius Springer.

qualities, all of which, as a union, go into the accurate localization of bodily sensation. The material and conclusions gathered by Schilder in "Das Körperschema," show that this scheme is also the prerequisite for the individual variations of movement and also for the appreciation, not only of bodily space, but external spatial relations. The presence and operation of such a mechanism may best be portrayed by the cases of amputation wherein the amputated limb is still felt and hallucinated in all its original qualities. Particularly the transformations this sensation of the limb may undergo in time and under cortical lesion give weight to the operation of such a scheme.

The relation this diagram bears to action is perhaps best observed in those cases in which the comprehension of space is preserved but a disturbance in movement, an apraxia is nevertheless present. From this point of view apraxia becomes, along with aphasia, important for the problem of localization. When Broca demonstrated his pathological material and his case histories of aphasia, it became understood that such lesions of certain brain fields resulted directly in the loss of definite powers. Those powers were considered to have their seat, to be localized, in those circumscribed portions of the brain. Bergson clearly demonstrated that in cortical lesions there could be no talk of the loss of any powers in the sense that they had been annihilated and Marie probably meant the same correction when he stated aphasia to be the result, not of local destruction, but of defective intelligence. Pötzl and Schilder have completed the evidence that, in general, the word images are always present only that the destruction of nervous apparatus represses them, so to speak, precludes them from being assimilated and expressed, *i.e.*, understood. Apraxia is to be evaluated in the same sense. The intentions, the basic body diagram, is preserved, but the individual has no control over the motor apparatus. [See Hughlings Jackson.]

Here we must ask how are such psychic changes then to be explained? What is the relation between the organic structure and the psychic process? It is plain that these discussions contain a psychological conception of the rôle of nervous structures in the form developed above for the function of the organism in schizophrenic thought. Psychic experiences have a certain energy, a quality of force which insures them a dynamic relation in the stream of life. It has been sufficiently disclosed that the carrying agent of an action or a thought must be an emotional, an affective tendency, the peculiar energy of which defines the completeness and direction of the experience. The postulation of a psychic energy is legitimate

within the limits of the scientific point of view here outlined and psychoanalysis, as a matter of fact, means just such an energy in the concept of the libido. Freud also points out that the impulse has the character of importunity, pressure (des Orängenden). Schilder has spoken of the affective coefficient of an experience (Wirkungswert) and from the biological, scientific point of view this affective coefficient must be conceived in organic as well as psychological terms.[16] The effectiveness of an instinct depends, first of all, upon its own past, but beyond this upon the viability of the apparatus at its service, upon the integrity of the organism. Any dysfunction of nervous apparatus must have its effect on the effectiveness of an instinct and this influence is precisely what is meant when Schilder speaks of the displacement of psychic energy (Niveauverschiebung) or psychoanalysis of the displacement of the libido (Libidoverschiebung). We have presented the conception of the organic factor in schizophrenia from this point of view. The study of cases of aphasia and apraxia discloses mechanisms unusually analogous to the neurotic symptoms of repression, reappearance of repressed material, etc. The analogy must not be misunderstood to mean that a sensory aphasia is therefore a neurosis. It is simply that destruction of nervous material has the biological function of displacing but not disrupting the biological effectiveness of psychic experience.

The meaning of such a conception is perhaps best appreciated in the case of the intoxications. Certain poisons have an apparent relation to definite psychophysical systems, they vary in their clinical manifestations, seeming to affect divers affective spheres in a specific manner. Mescalin and allied poisons have been known to produce conditions very similar to certain forms of schizophrenia. Alcohol not only impairs sexual potence, but from the analytic point of view it is remarkable that the predisposing psychology and results of chronic alcoholism reflect each other in their production of primary instinctive elements; homosexuality. This is particularly evident in the pathologic jealousy of chronic alcoholism. These interrelations between the psychic results of poisoning and the affective constellation which may predispose to the drug habit is even more clearly demonstrated by cocaine. Not only does homosexuality seem to have an empirically strong affinity for the drug habit but the

[16] Schilder, Paul. Ueber den Wirkungswert psychischer Erlebnisse und über die Vielheit der Quellgebiete der psychischen Energie. Arch. f. Psych., 1923, Vol. 70.

observations of the Vienna clinic (Hartmann)[17] show that particularly cocainism induces and increases homosexual tendencies. The action of the poisons thus seems to be specific for certain psychic processes and may be psychologically formulated in a direction similar to organic disturbance affecting the impulses similarly. A displacement of psychic energy occurs in which the biological character is transformed to more regressive stages.

We are thus able to see how the problems of psychophysical interdependence may be approached psychologically and how the systems of action in speech and movement are susceptible to a coherent psychological analysis. But the psychology of action is open to physiological analysis also. Indeed the results of pathological studies are fully compatible with the points of view outlined here. The work of C. and O. Vogt has been evaluated and extended by Gerstmann and Schilder.[18] The disturbances in locomotion observed in the akinetic and hyperkinetic states of subcortical lesions (encephalitis) are certainly of physical origin, but the "drive" which is so necessary to action, which seems here to be particularly disturbed, is psychically represented. Succinctly, there is not an excess of impulse (in hyperkinesis) in these cases, but an excess of locomotion, an important consideration, for we see manifold similarities in the various stages of schizophrenia. In the latter cases, however, the locomotor and speech disturbances have a psychogenetic origin. Apparently, and these are conclusions to which Gerstmann and Schilder arrive, the apparatus of the brain may be influenced in the same direction psychically and physically. Schilder speaks of the principle of double expression (Prinzip des doppelten Weges).[19] The symptoms of lesions in the subcortex as well as in the cortex, as exemplified in encephalitis and the aphasias, are susceptible to remarkable influence from the sphere of the psychic. Observations have been made on the emotional changes of such symptoms, and it is an old clinical fact that chorea is more acutely disclosed under the influence of the emotions, attention, etc. The manifestations of nervous symptoms and psychic disturbances become more and more clearly related. They are not isolated or sporadic dysfunctions speaking the language peculiar to an individual organ. They possess a common scource in the whole personality of the individual and express, in manifold form only, the single biological meaning of

[17] Hartmann, H. Cocainismus und Homosexualität. Zeit. f. d. ges. Neurol. und Psych., 1925. Cited after Schilder "Psych. auf Psycho. Grundlage."

[18] Gerstmann, Joseph, and Schilder, Paul. Studien über Bewegungsstörungen, I–VIII. Zeit. f. d. ges. Neurol. und Psych., 1920–1923.

[19] Loc. cit., No. 6.

the organism. The notion of localization which conceives certain capacities as residing in certain material quarters must necessarily see in the concept: psychic, a chaos, and in the products of cerebral lesions an equal nonsense. But psychic systems and expression may be localized only in the whole personality, a point of view which permits an approach to the essentially related meaning in nervous as well as mental disturbances. The reciprocal action of mind and body does not mean that subcortical disease must produce a psychosis or a neurosis. These conditions are determined alone by a primary constellation of the instincts (the psychoanalytic instinct fixation). The pathological condition of nervous mechanisms may, nevertheless, invite the appearance of neurotic symptoms precipated more easily by psychic provocation. Nor does the psychic influence of organic symptom complexes designate these as neurotic. It means simply that neurotic and organic pathological states must have the same organic basis of action. Modern psychiatry lays emphasis on the biological foundation of the psychoanalytic theory of instincts.[20]

Having described the relation of biologic to psychologic phenomena, the question arises as to the influence of the psyche on the body, a question attracting close attention in psychiatric circles to-day. That the realm of psychic experience must be considered an independent, a primary one, is a conception already developed. That such experiences have a direct influence on the various organs of the body is a fact empirically corroborated. When fright causes incontinence or shame blushing we experience an understandable connection, although recent investigations have disclosed direct physical destruction as a result of fright. In general, we speak of the bodily results as expressions of the emotions, but it is probably more accurate to consider them as direct effects. That organic lesions may result from emotional experience of great suddenness and force, as in sudden greying of hair from shock, takes on more than an intuitively comprehensible character, and becomes scientifically clearer in the light of the reciprocal relation existing between psychic and nervous apparatus. This relation is comprehensible by means of the concept described as the affective coefficient of psychic experience, a concept by which Schilder means precisely these physical processes which are the partial result of experience altogether. It is a concept which attempts to describe a positive, physical energy factor, but

[20] The whole import of this crucial problem is well arranged in Schilder, Paul, Einige Bemerkungen zu der Problemsphäre Cortex, Stammganglien—Psyche, Neurose. Zeit. f. d. ges. Neurol. und Psych., 1922, Vol. 74.

it has also its psychic representation. The coefficient of an experience is determined by past experiences, by the terms of the present one, and by constitutional and dispositional bodily factors. In its force it expresses itself, on the one hand, in psychic activity, *e.g.*, thoughts, volition, etc., on the other hand, in directly experienced bodily changes. Such physical changes (whether bodily motions or palpitation of the heart) are precisely the expression of particular affective coefficients which have their bases in the equally physical constitutional factors. The individual physical results of psychic life need not be detailed here, they are found wherever blood and nerves are found. As a matter of fact, the majority of such symptoms usually occur directly or indirectly via the vascular system; but an important path is the sympathetic-parasympathetic system via the diencephalon, which has connections not only with the vessels but innervates skeletal and unstriated muscles as well. This system, further, controls the glands of internal secretion, a hormonal apparatus which in turn influences the psychically approachable subcortex. These systems are thus not only under the influence of feeling (primarily a cortical process when analyzed under the point of view that feeling is concerned about images, thoughts, or structures similarly dependent upon the cortex) but send in turn regulative impulses to the cerebrum. The elements of experience are thus organic parts of an unified complex, and although much is gained by conceptions of glandular formulae and the like, the nature of mental experience is no more exhausted by them than the nature of a machine by an analysis of its parts. The tendency to give concrete form to this position is well enough illustrated by the at least progressive position of Jelliffe, Groddeck, and others. Jelliffe has observed the objective and subjective success of psychotherapy in a case of sarcoma of the shin bone, of tuberculosis, chronic nephritis, and in many other internal cases. Whether the influence of organic disease by psychic methods is accepted as an indication of its psychogenesis must be left open. But it seems that, for the present, Schilder's differentiation between nervous and psychic origin prevails among the clinicians.[12] Jelliffe's further adherence to the possibility of a psychogenetic origin of lasting organic changes cannot but be accepted as logically consequential from the point of view developed here. For, if it be recog-

[21] An excellent contribution to this whole problem is the book edited by O. Schwarz, Psychogenesis and Psychother. of Physical Symptoms, 1925, Vienna, Julius Springer. It contains a chapter by Schilder on the "Problem of psychophysical relations, etc.," which appends extensive literature on the question as here outlined.

nized that temporary organic changes can be the expression of psychic activity, as shown by Schilder's studies and numerous cases from every other field of medicine, we must accept the possibility of such changes for a longer time. The two are not essentially to be differentiated, although the empirical data may not be entirely complete.

An illumuniation of the rôle of the psyche in its influence on the body, especially its biological affinity to the vegetative system, is offered by the investigations of hypnosis. To the literature of hypnosis Schilder (with Kauders) has just recently added a most cogently conceived and written little textbook.[22] On the basis of a wide clinical and analytic experience the nature of hypnosis, suggestion, and their therapeutic management in the light of psychoanalysis and pathology are systematically presented. It is not without foundation that among the laity hypnosis and love have a great affinity. This relation has not only its typical expression, but the divers characteristics of the hypnotizer as well as the hypnotized bear a great analogy to typically sexual scenes. This analogy is carried through by a systematic analysis of the psychic content of the hypnotic state on the basis of psychoanalytic psychology. Hypnosis, that sleep-like state of suggestibility in which "we may, without sufficiently real foundation, be brought to imagine, perceive, and judge, even to act," is fully understandable in the terms of an instinct psychology. The hypnotic state is one in which the ideal ego still preserves a modicum of instinctive force, the remainder having become adjusted in a more infantile, masochistic constellation at the partial disposal of the hypnotizer. It is precisely the reserved, incomplete regression which explains the important forensic problem of hypnosis. For the ideal ego still directs the individual in the fulfillment only of those acts which are not at odds with itself. This psychic regression has physical effects, however, and hypnotism presents a large body of phenomena in the vasomotor-vegetative realm similar in principle to the physical results of the equally regressive state of sleep. The phenomena fall generally under the head of primitive muscular action on the one hand (catalepsy, etc.), and vascular changes on the other. These psychic and physical facts are not without an important inner coherence when we consider the following. The mechanism of sleep or hypnosis occurs on the basis of a practically certain nervous center situated in the region of the III ventricle.[23] In close phylogenetic

[22] Schilder, Paul, and O. Kauders. Lehrbuch d. Hypnose, 1926, Vienna, Julius Springer.

[23] von Economo. Die Pathologie d. Schlafes. Handb. d. norm. und path. Physiol., Vol. 17, 1926, Berlin, Julius Springer.

and morphologic relation to this center is to be found an actual nest of other centers regulating the vegetative economy of the body, aside from the striatum-pallidum system supervising the physical character of movement. The brain represents a hierarchy of more complex and more primitive systems which become less plastic, more differentiated, in the scale upward just as we have described a similar structural composition in the psychic realm. We have also noted that the lower nervous centers are at all times represented in the function of the cortex, just as the more primitive elements of the sphere are the ever present base from which clearly defined mental phenomena spring. The more definite elements of psychic experience are clearly related to the functions of the cortex, and the function of the lower centers and their glandular organs begins to preponderate in direct relation to the preponderance of the emotions in psychic life, elements which we consider to be phylogenetically and ontogenetically primitive. Hypnosis is attendant to a psychologically primitive state, but the physiological condition induced is, in general, of exactly the same category. Schilder has stated somewhere that the results of a thoroughly consequential psychological analysis and those of a physiological comprehension of phenomena must ultimately lead to the same results. His formulations on hypnosis well illustrate the meaning of his conjecture and the essential totality of the organism.

The particular substance of Schilder's contributions to psychiatry and psychology represents the general character of modern psychiatry, especially as conceived by the various German schools. It is a position not less pronounced with Bleuler and the Zürich school than by the successors to Kraepelin and the north Germans. To some it may appear as if many of these doctrines are not less than an adaptation of purely Freudian principles to the tenets of phenomenology and modern epistemology, and this has indeed been thrown up to Schilder as an unwarranted fault.[24] At bottom, however, psychoanalysis, phenomenology, and biological science are no more at variance than psychic and physical phenomena, and may, like these, be legitimately associated in a synthetic conception of the individuality. It was specifically explained above that a psychoanalytic consideration of psychic phenomena in no way disturbs or precludes a phenomenology of psychic structures, or *vice versa*. To a fruitful comprehension of the whole of mental problems they both lend a fundamental weight.

[24] Int. Zeit. für Psychoanalyse, 1923, No. 4, contains a critique of Schilder's formulations on the Unconscious which is a distillate of this position. In the same number is a critical review of Binswanger's "Intro. to the Problems of gen. Psychology" which bears the same tone.

The complaint of some psychoanalysts that other psychological approaches are characterized by an inevitable "degeneration" to philosophical niceties is not so acute when one remembers that all the prevailing psychiatric methods proceed from generally the same philosophical platform. The efforts of the phenomenologists, among them Schilder, to differentiate the subject of investigation accurately from philosophical preconceptions is at least more laudable than to promote such metaphysical postulates as manifest empirical evidence. In this sense the amalgamation of psychoanalysis with other principles to a synthetic science of the mind is legitimate, and in no way circumscribes the clinical or scientific procedure of the former. True, the mind may be conceived in a directly intuitive observation, the avowedly nonscientific position of Jaspers and the pure phenomenologists who distinctly differentiate between psychically understandable relations and scientifically explainable ones. The position of psychoanalysis, accepting the strict methods of natural science in the particular respect of the notion of causality, is, however, in no wise invalidated by such a viewpoint. For psychoanalysis may legitimately choose for itself that sphere of mental phenomena which is approachable by the notion of cause and its essentially mathematical corollaries.

Since the philosophical studies of Bergson and the psychological papers of Dilthey, not to mention the efforts of Driesch and the biologists, we have come more and more to accept the notion of the organism, the form, from the point of view of a primary spiritual monism. In concert with the ideas of Bergson, Schilder and others have conceived the psychic element as an integral link in the chain of causality altogether. It is an element which cannot be neglected in consequential occurrences; and the division indicated above in psychiatric investigations has taken place even in the physical sciences with the introduction by Köhler of ideas of Ehrenfels on "physical forms" (physikalische Gestalten). From the knowledge which has been collected it must be noted that the outright causal materialism of the natural sciences cannot be accepted as logically binding in an epistemology. For, quite apart from the fact that scientific operation is a manipulation of primary psychic phenomena, the problem of the form, the organism, the given totality of objects, is not exhausted by an enumeration either of its parts or its consecutive arrangement. The quality of things is not in the least impinged upon by a quantitative analysis.[25] The peculiar properties of form, purpose, etc., which characterize the organism are, in principle, strange to a quantitative

[25] This basic problem is excellently summarized in the first section of Schwarz's book, Vide No. 21.

formulation, and Schopenhauer's mot that " where calculation begins, understanding ceases," seems to speak a deep truth. From this point of view, the logical practice of a psychophysical parallelism is untenable because it does not leave sufficient room for the comprehension of the fundamental rôle of the psyche in causation. Psychophysical parallelism, accenting, as it does, the ultimate material source of movement and causation, dispenses with even a modicum of room, for causality is to it a closed ring eventually calculable *ad finem*. It has been pointed out, however, that the closest of scientific formulation has acknowledged that physical laws are, at bottom, probabilities, and that the deeper the analysis is carried the greater the coefficient of probability becomes. The basis of scientific law is thus chaos, a situation comprehensible only when one leaves a qualitative character remaining to nature after the deduction of a quantitative calculation. The so-called " limit of scientific error " is not unnatural to a thoroughgoing monism of another kind. The freedom of the will is that accent which gives quality to nature.[26]

The psyche, the character of an organism is not scientifically comprehensible as such, but appreciable only by methods to which we do not give the name of science. Does this mean that we cannot or should not approach the mind scientifically? The answer to the first is given by Bergson, who explained that psychic activity, although comprehensible only in experience, may be scientifically analyzed as soon as it is past, that is, dead. In answer to the second, Schilder points to the objectively manifest value of the scientific method as a means of coming by reality, be it psychic or otherwise. The history of science is for him an admonition to preserve it in psychiatry, and this is factually realized in the now well appreciated system of Freudian psychoanalysis. This position is also sufficiently clear to demonstrate the earnestness with which biologically oriented phenomenologists adapt the Freudian principles. Schilder's progress has been toward a synthetic appreciation of the form of experience as illustrated under pathological circumstances, and such is, in general, the character observed in the trend of modern psychiatry. To this end it has been necessary to define clearly the philosophical ground upon which modern method stands—a primary spiritual monism; to analyze the mental structures formally (phenomenology) and functionally (psychoanalysis), a combination of intuitive and scientific

[26] Schilder's specific rejection of psychophysical parallelism (in the material sense) lies in his point that the psychic side of experience is unbroken and constant as long as individual life; a factum not readily compatible with such a scientific premise.

methods; and to combine them under the principle of the biological unity of the individual. The results of such a position have been not only fruitful in the practical comprehension of clinical material, but they have disclosed possibilities for a reorganization of the philosophical point of departure. Succinctly, it may be indicated by a tendency to "psychologize" nature, to derive the organic forms of nature from primary roots of a psychic or vital tendency. But the appreciation of these growing comprehensions we must leave until they have ripened.

DIFFUSE GLIOMA (GLIOSIS)
REPORT OF TWO CASES*

By Frederick P. Moersch, M.D.

SECTION ON NEUROLOGY, MAYO CLINIC, ROCHESTER, MINNESOTA

It is still a debatable question whether cerebral gliosis should be considered as a clinical-pathological entity. Clinically there is no syndrome which can be so described, and pathologically the variations are so marked that intelligent interpretation of them seems impossible.

It is well recognized that gliomas have the unusual property of exhibiting at times, a most striking diffuseness; it is also true that what may appear clinically to be a tumor, on microscopic examination proves to be a diffuse process; or, in other words, a diffuse gliosis. Whether these two conditions are simply a variation of the same process remains to be worked out. The entire subject of gliosis, sclerosis, glioblastosis, and so forth, is involved in this discussion, but cases are gradually being brought together into definite clinical-pathological groups.

Moore in 1879, Schmaus in 1888, and Bullard in 1890, laid the foundation for the later description of a clinical-pathological syndrome: encephalitis periaxialis of Schilder, described by Schilder in 1912. Besides the syndrome of Schilder, diseases have been reported from time to time under the heading of gliosis and sclerosis which are difficult to differentiate from gliomas, either clinically or pathologically. Other cases have been reported which probably fall into the group of acute multiple sclerosis, but there still remains a group of cases to which the term gliosis is applied for want of better study or clearer understanding.

In discussing the relationship of glioma to gliosis one is confronted with the possibility of some congenital predisposition. Cohnheim believes that it has a bearing on tumors, spina bifida, syringomyelia, and so forth. Hastdegen says that embryonal anomalies of various types may exist in the same patient. He reports a case of spina bifida with tumors of the lateral ventricles in the newborn. Whether gliosis is of the nature of a tumor or an inflammatory

* Submitted for publication October 16, 1925.

condition of some degenerative type of glial cell reaction, as outlined by Jakob, it is difficult to say. Haberman asserts that the three conditions which may occur most frequently in masquerade of one another are encephalitis, multiple sclerosis, and brain tumor.

In cases of gliosis the pathologic structure runs riot and while always confluent may involve both hemispheres. Portions of the gliomatous mass may simulate definite tumor formations, but closer examination will show that it is a very diffuse process, hardly to be classified as tumor. Bonome makes the following distinctions between glioma and gliosis:

A glioma is a true tumor and always has a tendency to limitation; a gliosis has no limitation.

A glioma has an increase in cells and new formed blood vessels; gliosis is more an increase of normal glia and is not hemorrhagic.

A glioma degenerates; gliosis shows no degeneration.

A glioma, except in rare congenital cases, has no nerve cells or fibers; gliosis may show nerve cells or fibers.

A glioma shows cell changes; gliosis shows but few cell changes.

A glioma usually has only a moderate amount of fibers; gliosis shows an increase of fibers.

While this comparison would not now be considered entirely correct, it at least attempts a very definite distinction. Cassirer and Levy have divided the glioses into four groups: (1) glioblastosis (gliomatous growth), (2) acute or subacute multiple sclerosis, (3) subacute encephalitis, and (4) cerebral degenerations of childhood.

From this classification it would seem a simple matter to distinguish definitely between gliosis and glioma. Cassirer and Levy, and Landau have reported cases of diffuse gliosis which only after careful microscopic study were determined to be cases of glioma.

Report of Cases

Case 1. A man, aged thirty-eight, was struck on his left hip by a passing car September, 1923. He was hurled to the ground and rendered unconscious for a few minutes, following which he was confused. He was immediately taken to the hospital where it was found that he was still dazed. He complained of headaches and bled from a long scalp wound on the right side of his head. A neurologic examination showed little of consequence, but the spinal fluid examination showed a slightly bloody fluid which was clear on the following day.* In two weeks he made a good recovery and was dismissed from the hospital. Late in October he had a dizzy spell and was unconscious for two hours. A week later, on November 1, he developed mumps. He felt poorly for a month. Following his convalescence he complained of fre-

* The bloody fluid was probably the result of the local puncture.

quent dizzy spells and occasional headache, and he returned for examination, at which time he was somewhat slow. A tremor was noted around his eyes and his deep reflexes were unduly active. It was thought his condition was post-traumatic hysteria. In March, 1924, he received $5,000 damages. However he complained more frequently of headaches and at times it seemed that it was hard for him to coördinate the movements of his feet. His brother also noted that there was a definite change in his personality. His memory was poor, he was unable to concentrate and at times unable to carry on an intelligent conversation. Two similar unconscious attacks had occurred. The spinal fluid examined at this time (March) was normal. The roentgenogram of the head was negative and the fundi normal. It was now noted that he was distinctly changed in character, rather careless in his habits, indifferent, drowsy and

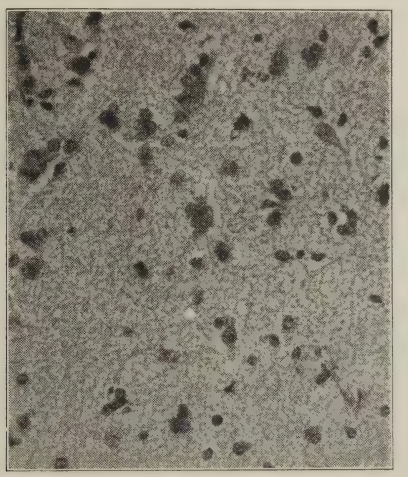


Fig. 1. Right superior frontal convolution, showing moderate increase of glial cells, some satellitosis and occasional red cells. Hematoxylin and eosin. (X250.)

disoriented for time and place, and the eyes showed a slight horizontal nystagmus, the facies appeared somewhat mask-like and the voice was monotonous. There was a moderate increase of tonus in both upper and lower extremities. No diagnosis was made.

The patient seemed to improve for a month or so, then gradually became worse. He complained of almost constant frontal headache, and had severe vomiting spells, failing vision and impairment of hearing. He frequently fell because of dizziness. His condition showed considerable and abrupt fluctuations. He would lie about most of the day sleeping, and showed but little interest in what went on about him. Examination showed horizontal nystagmus, moderate dysarthria with dysphagia. The deep reflexes were markedly exaggerated, the gait was ataxic and spastic, and coördination was markedly impaired. Because of this decidedly changed condition he was sent to the hospital. During the following few days his condition varied considerably; at times he was so stupid that it was practically impossible to arouse him. At

no time were any constant localizing signs noted. He developed hiccough, and showed transitory ptosis of both lids, weakness of the left seventh nerve, absence of abdominal reflexes and a positive Babinski on the right side, besides the increase in the deep reflexes. The spinal fluid was under increased pressure, but was otherwise normal. The nasal margins of the fundi were slightly blurred. He died suddenly September 25, 1924.

At necropsy the large scalp wound over the frontal bone near the vertex was still present, but there was no indication of fracture. The surface of the brain was dry, the convolutions flattened and the sulci almost obliterated. The brain weighed 1,775 gm. When the longitudinal fissure was opened it was noted that the corpus callosum was markedly thickened and felt leathery. On section the brain tissue was extremely hard. This hardness was diffuse, most marked in the frontal regions, but extended backward into the basal ganglia, more so on the left side. Sections stained with hematoxylin and eosin, with Nissl's and Mann's stain, showed a diffuse glial reaction involving the frontal lobes, the corpus callosum and gradually fading off into the midbrain and the

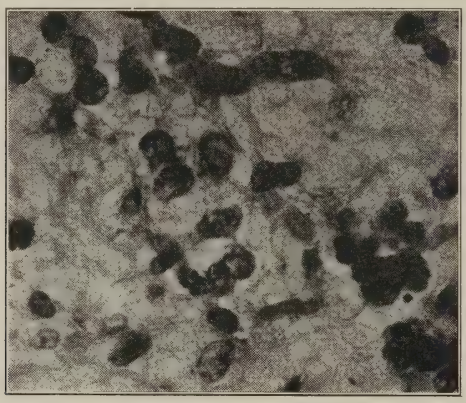


Fig. 2. Section from insula, showing large glial cells, "gliarasen" and mitotic figures. (X700.)

basal nuclei. The occipital convolutions showed very little change. Sections from the left motor cortex showed some increase in glial cells, with slight perivascular glial cell reaction, some satellitosis and occasional rod cells (Fig. 1). From this slight very diffuse change the sections gradually took on a much more definite tumor formation toward the insula and corpus callosum, showing large glial cells, neuronophages, "gliarasen," cells with mitotic figures, various types of hyperchromatosis and ameboid cells, all indicating progressive changes (Fig. 2). Sections stained with Mann's stain showed numerous large ameboid cells (Fig. 3). Cajal and Weigert stains showed nothing abnormal. This increase of glial cells extended well into the thalamus, where large swollen glial cells showing nuclear changes and signs of degeneration were common and small amounts of blood pigment were seen, both intracellular and extracellular (Fig. 4). This gliosis was of a diffuse character involving both the gray and white matter. There was no tendency

toward limitation, no degeneration, and comparatively little destruction of nerve cells.

In this patient the inevitable trauma stood out very prominently. The clinical history was rather opposed to a diagnosis of encephalitis and the only pathologic evidence was a small amount of blood pigment, there being no evidence of inflammation in any of the sections which came from representative areas of the entire brain. This possibility is mentioned, however, in view of the diffuseness of the lesion and its atypical character. The entire illness lasted about one year which is somewhat short for tumor. If the injury was a factor in the production of the gliosis there was little evidence of it now. Clinically the symptoms were of a diffuse character, marked by a

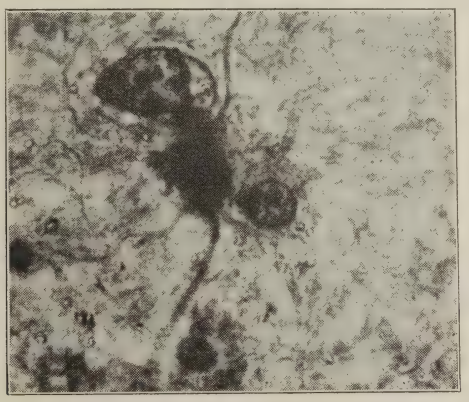


Fig. 3. Section from right frontal lobe, showing large ameboid cells. Mann's stain. (X700.)

change of temperament, spells of unconsciousness, cranial nerve palsies and other diffuse cerebral signs. In spite of the short history the possibility of brain tumor had to be considered; however, the diffuse character of the signs and the absence of any focal symptoms made one hesitate definitely to diagnose a brain tumor, and, as the necropsy showed, the case might well be considered one of a diffuse glioma or gliosis.

In Case 2 the history was much more definitely that of a brain tumor but the pathologic findings again presented the same diffuse character.

Case 2. A man, aged twenty-three, had been perfectly well until January, 1922, about which time he suddenly began to have daily attacks of cramps in his stomach radiating up to his mouth, associated with rather severe bilateral frontal headaches, gradually increasing in severity. There was no loss of

consciousness, no paralysis or weakness. In May, 1922, his headaches became splitting in character, and by June he noted some dimness of vision. By July he was completely blind, except that at times his vision would return for a few days at a time when he was able to read the newspaper. In August for the first time, he suddenly lost consciousness and became rigid all over. This was followed by general weakness and drowsiness. From August on the attacks occurred about two or three times a month, lasting from five to twenty minutes. The early minor attacks also continued. Following the onset of his blindness his headaches diminished. He never complained of any hallucinations of taste, smell or vision, but it was noted that his memory, attention and coöperation were gradually failing. He also gradually gained in weight and on two occasions during his attacks had bladder incontinence. Physical examination proved to be essentially negative throughout. A roentgenogram of the head showed a normal sella. Vision was absent. The pupils were dilated and failed to react to light. The fundus showed optic atrophy

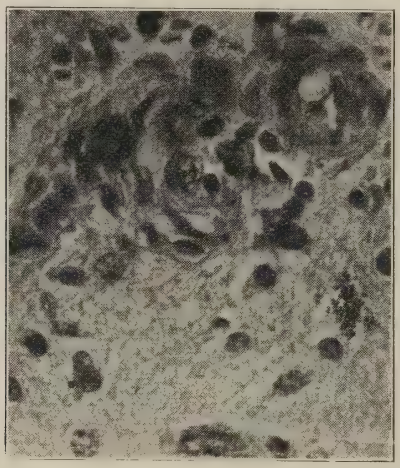


Fig. 4. Section from right thalamus, showing large glial cells, some neuronophages and some blood pigment. (X500.)

secondary to chocked discs. The neurologic examination showed a slight horizontal nystagmus, but gave no evidence of any localized intracranial lesion. A ventriculogram, June 18, 1923, was indeterminate. June 28 a bilateral cerebellar exploratory operation was performed because of the possibility of a lesion of the brain stem. The patient died July 15.

At necropsy the dura mater was under marked tension. The posterior portions of the cerebellum showed evidence of the recent operation. The entire right cerebrum was hard and leathery. This thickening extended into the corpus callosum and to some extent into the left frontal lobe. Sections were taken from representative areas and stained with hematoxylin and eosin, Nissl's, Mann's, Cajal's and Weigert's stains. Microscopic examination showed a diffuse gliosis extending through the entire right cerebrum, most marked in the anterior portions and to a lesser extent in the left cerebrum and basal nuclei. The nerve cells, as in the preceding case, remained fairly

intact but the glial changes were very marked and of a progressive character. In the anterior portions of the frontal areas (Fig. 5), the increase in glial cells was not so marked as in the posterior portions of the frontal lobes or in the deeper subcortical substance. In some areas large, protoplasmatic glial cells with single or multiple nuclei were present. The right frontal lobe especially showed numerous macrophages with some mitosis (Fig. 6).

In this patient the clinical history extended over eighteen months. How much longer the patient might have lived had surgical intervention been postponed it is difficult to say. While there were no localizing signs, the history, the progress, and such findings as were present, definitely suggested a neoplasm, probably in the region of the third ventricle. In the former case there seemed little doubt

Fig. 5. Section from right motor cortex, showing increase in glial cells. Glial cells with multiple nuclei and large clear cell body. Stain hematoxylin and eosin. (X220.)

that the process was of a diffuse character, the two cases presenting no clinical similarity.

It would be difficult to correlate the clinical histories of these two cases and yet the pathological findings, while not of a similar character, presented sufficient similarity to warrant the diagnosis of diffuse cerebral gliosis. Whether or not the differentiation between gliosis and glioma as given by Bonome could be followed in these cases is uncertain, and it might well be supposed that this diffuse gliosis was nothing more than a very cellular, rapidly growing glioma. Both Heubner and Kaufmann report cases of a diffuse sclerosis of the brain, especially in children, in which the "hart-elastisch" feel

is so marked. Schmaus considers this sclerosis as the end product of an interstitial process, usually the result of an inflammatory condition. Certain it is that frequently cases are diagnosed clinically as brain tumor, and even so considered pathologically, unless a careful study is made and the diffuseness and character of the lesion appreciated. The possibility that one is dealing with the end result of an inflammatory process as encephalitis, either traumatic or inflam-

Fig. 6. Section from right frontal lobe, showing marked increase in cells with many bipolar cells and numerous mitotic figures. Stain hematoxylin and eosin. (X220.)

matory, must also be considered, since encephalitis may occasionally present the clinical picture of a brain tumor, or, as Parker has reported, brain tumors may be diagnosed encephalitis.

Summary

In the cases here reported a pathologic diagnosis of glioma would hardly seem justified since it was precluded by the character of the lesion and its unusual diffuseness, without more serious damage to the parenchyma of the brain. The possibility of gliosis being a sequela of cerebral trauma or inflammatory process must be considered. Undoubtedly cases of this type are usually looked on at necropsy as gliomas, if no careful microscopic study is made; a single section taken from the lesion may readily be considered as glioma. It is doubtful if such differentiation as that attempted here has any clinical value since the diagnosis must apparently be established pathologically. From the cases reported in the literature and those

I have observed, the hard leathery feel of the entire affected area is most characteristic.

BIBLIOGRAPHY

1. Bonome, A. Bau und Histiogenese des pathologischen neuroglia Gewebes. Virchow's Arch. f. path. Anat., 1901, clxiii, 441–497.
2. Bullard, W. N. Diffuse Cortical Sclerosis of the Brain in Children. Jour. Nerv. and Ment. Dis., 1890, xvii, 699–709.
3. Cassirer and Levy. Die Formen des Glioblastose und ihre Stellung zur diffusen Hirnsklerose. Ztschr. f. d. ges. Neurol. u. Psychiat., 1923, lxxxi, 290–310.
4. Cohnheim. Quoted by Bonome.
5. Haberman, J. V. Encephalitis disseminata. Jour. Nerv. and Ment. Dis., 1923, lvii, 463–484.
6. Hastdegen. Quoted by Bonome.
7. Heubner, O. Über diffuse Hirnsklerose. Charite-Ann., 1897, xxii, 290–310.
8. Jakob, A. Über atypische Gliareaktionen im Zentralnervensystem. Ziegler's Beitr., 1921, lxix, 197–221.
9. Kaufmann, Edward. Lehrbuch der speziellen pathologischen Anatomie für Studierende und Ärzte. 7 ed. Berlin, Gruyter, 1922, ii, p. 1479.
10. Landau, Max. Das diffuse Gliom des Gehirns. Frankfurter Ztschr. f. Path., 1910, v, 469–514.
11. Moore, Norman. Sclerosis of the Cerebral Cortex, with Two Other Examples of Cerebral Disease in Children. St. Barth. Hosp. Rep., 1879, xv, 63–74.
12. Parker, H. L. Tumors of the Brain Simulating Epidemic Encephalitis and Involving the Third Ventricle, the Fourth Ventricle, and the Basal Ganglia: Report of Three Cases. Jour. Nerv. and Ment. Dis., 1923, lviii, 1–15.
13. Schilder, P. Zur Kenntnis der sogenannten diffusen Sklerose. Ztschr. f. d. ges. Neurol. u. Psychiat., 1912, x, 1–60.
14. Schilder, P. Zur Frage der Encephalitis periaxialis diffuse. Ztschr. f. d. ges. Neurol. u. Psychiat., 1923, xv, 359–376.
15. Schmaus, H. Zur Kenntniss der diffusen Hirnsklerose. Virchow's Arch. f. path. Anat., 1888, cxiv, 154–172.

FACIAL DIPLEGIA IN NEOARSPHENAMIN POLYNEURITIS *

By George B. Hassin, M.D., and Chas. F. Read, M.D.
CHICAGO

If one considers the enormous amount of arsphenamin and neoarsphenamin given daily, it is a wonder that nerve complications in the form of polyneuritis are so uncommon. Comparatively common is involvement of the optic and acoustic nerves, while that of the facial nerve is exceptionally rare. So far as we are aware, only Spillman (1) reported seventh nerve paralysis in the course of an arsphenamin polyneuritis, two cases, one very briefly. Bennario, quoted by Pelissier,(2) found in the literature this nerve implicated in 25 of 126 cases of paralysis after arsphenamin. Cases of bilateral facial paralysis complicating an arsphenamin or neoarsphenamin polyneuritis are not recorded, though mentioned in some statistics.

Report of the Case

A married woman, a nurse, aged twenty-one, entered the neurologic service (Dr. Hassin) June 23, 1924, complaining of severe pain "all over the body," inability to move the extremities and difficulty in talking and chewing.

History: On May 27, 1924, she received in the Cook County jail an intravenous injection of 0.45 of neoarsphenamin. She stated that after the injection she fell "over upon her face" and for two hours she could not "see, talk or move." One week later, when she was released from the jail, she began to experience tingling in the toes and fingers, numbness, quivering and "swelling" of her upper lip and general weakness. In four days the abnormal sensations spread "from the toes to the face" and were accompanied by pain which was so severe that the patient could not bear the weight of her clothes. The weakness rapidly progressed and resulted, one week after the onset of paresthesias, in a total paralysis of the face and all four extremities.

Previous History: The patient stated that since the age of fourteen her blood had showed a positive Wassermann and that her father, a sister and two brothers also had a positive Wassermann reaction. She was not sure whether the same was true of her mother or not. She denied acquired venereal diseases, but admitted occasional drinking of small amounts of home-made wine.

She had had several courses of treatment with mercury and two salvarsan injections, in addition to the one she received while an inmate of the jail.

She was separated from her husband and never had been pregnant.

* From the neurologic service of Cook County Hospital, Chicago.

Examination: A well nourished young white woman in a rather critical condition. She lay helpless on her back, the general musculature relaxed, the face expressionless, speech markedly dysarthric with inability to enunciate labials, close her eyes, wrinkle her forehead, whistle or pucker her lips. The lower lip was drooping, the tongue was coated and tremulous. Active movements in the shoulders, elbows, hips and knee joints were limited, and abolished in the hands and feet. Passive movements were free and rather painful. The large nerve trunks (peroneal, posterior tibial) as well as the muscles, including those of the face, were painful to touch and pressure. The tendon reflexes were abolished throughout and the abdominal reflex was absent on the left side. The pupils, fundi, lungs, heart and liver were normal. Mental condition was good. The urine showed traces of albumin; the blood pressure was 124 systolic and 76 diastolic. The temperature was 98.6 F., pulse 112 and respiration 20. The blood Wassermann was + + +. A spinal puncture had not been done.

Course: During the next days quite severe pain was complained of in the face and legs, especially the right one where it extended up to the hip. The patient could hardly bear the slightest pressure and was constantly clamoring for morphine. The hands and the "inside of the mouth" were complained of as being "ice cold," though the hands were quite warm to touch. Position and stereognostic senses were markedly disturbed; general sensibility was normal save for hyperesthesia in the upper extremities and a tactile anesthesia on the dorsum of the left foot. An electrical examination on July 2, 1924, showed loss of faradic and galvanic responses from all the branches of both facial nerves and the muscles supplied by them, and the presence of a direct galvanic response with the muscular contractions flabby and the ACC slightly stronger than CCC. The same condition was found in the lower extremities where the ACC was equal to CCC.

July 14, 1924, slight improvement was noted in the facial expression; lips and eyes closed better. Tactile and pain sensations were markedly impaired in the upper extremities, absent in the feet and present in the trunk. Muscle power in the hands and feet was slowly returning but the feet were drooping and inverted. There was marked ataxia in the hands.

August 2, 1924, severe pain was complained of in the feet and breasts; the ice cold sensation in the mouth had disappeared but was still present in the feet and hands. Patient recognized wool cotton, heat and cold in the left arm and leg transferring the location of stimuli to the opposite side (allochyria). The position sense was also better perceived, but stereognosis was still markedly impaired. For the last ten days there had been a great improvement in the muscle power of the masticators (could chew better) while the muscles of the extremities appeared flabby and atrophied, much more so than two weeks previously.

During the following days, up until August 23, 1924, when the patient left the hospital, marked and progressive improvement was noted. Speech, sensibility (including the stereognostic sense) improved considerably; patient could move her feet, but the pain and the ataxia still persisted. She complained of burning sensations in urinating and occasionally of loss of bladder control during sleep.

April 23, 1925, patient stated the pain had disappeared in January, about six and one-half months after the onset of the illness; in February she had

begun to walk on crutches. The gait, speech, active and passive movements at this time (April, 1925) were normal. Taste which was lost during the greater part of illness had returned; the face was slightly asymmetrical, the right corner of the mouth being somewhat lower than the left, probably due to a secondary contracture of the left nasolabial fold. Closure of the left eye was associated with muscular contractions in the left corner of the mouth, the tendon reflexes were absent except the right knee jerk which was diminished; the muscles were slightly sensitive and readily responded to the faradic and galvanic currents, with the ACC>CCC.

August 21, 1925, a year after the patient left the hospital: Sensibility, muscle power, coördination, reflexes, gait and electrical findings (faradic only; galvanic current caused nausea and vomiting and had to be dispensed with) were all normal. The face was still asymmetrical with a slight drooping of the right corner of the mouth and the presence of associated movements in the left corner of the mouth upon attempts to close the corresponding eye. For several months the patient had been able to attend to her work as a nurse.

Comments

The clinical picture was that of a generalized polyneuritis complicated by a facial diplegia. In addition, there were evidences of involvement of the fifth nerve—pain in the face, ice-cold sensations in the mouth, impaired sensibility in the face, and inability to chew. The onset and course were gradual—paresthesias with muscular weakness were followed, within a week, by paralysis of the distal portions of the extremities, scattered anesthesias, and ataxia. The symptoms and signs as outlined developed eight days after an intravenous injection of 0.45 neoarsphenamin in a person with hereditary syphilis and a moderate drinker of wine. They somewhat resembled the symptom-complex of subacute combined cord degeneration, but were acute in their onset and course and ended in recovery. It is quite likely that in both conditions the symptomatology is due to a systemic lesion, a toxemia. In subacute cord degeneration some toxic agent involves the motor and sensory *central* nerve fibers; in generalized polyneuritis, such as that under discussion, it caused a combined degeneration of the *peripheral* (motor and sensory) nerve fibers. While the nature of the toxic agent responsible for the subacute cord degeneration is not known, in peripheral neuritis it may be fairly definitely ascertained in the majority of cases. In the present case, for instance, it might have been due to syphilis, alcoholism, or the neoarsphenamin. That syphilis may cause a generalized polyneuritis with or without facial nerve involvement is admitted by a number of authors (Ménard,[3] Guieu and Pons [4]), but only in the early, primary, or secondary stages. Ménard reluctantly admits the possibility of a polyneuritis even in the tertiary stage of syphilis,

provided it is acquired. This was not the case with our patient. Neither can the alcohol etiology be considered, for alcoholic polyneuritis does not implicate the cranial nerves; nor could it well develop in our patient, who, kept in jail from May 22 to June 4, most likely did not have an opportunity to use alcoholic beverages of any kind. It is therefore probable that the neoarsphenamin injection was responsible for the polyneuritis and the facial diplegia. In other words, we were dealing with an arsphenamin generalized polyneuritis. The clinical picture of the latter in no way differed from that due to an ordinary arsenical poisoning. This is rather significant in view of the discussions raised as to the genesis of so-called arsphenamin or neoarsphenamin polyneuritis, *i.e.*, whether this is due to the neurotropic action or to that of the arsenic itself. The neurotropic action, however, is instrumental only in the early stages,(4) that is, in acquired syphilis, affecting usually the second and eighth nerves. The fact that cases of arsphenamin polyneuritis have been recorded in patients in which a history of syphilis was rather doubtful (case of Solomin,[5] for instance), or in patients that never had had syphilis and had taken ordinary arsenious acid in large doses (case of Raymond and Lejonne [6]), one must admit that arsphenamin, like an ordinary arsenical polyneuritis, is the result of the chemical action of the arsenic itself.

The remarkable feature is the late manifestation of the chemical action. This was in our case about one week after the injection, in Solomin's patient the interval was four weeks, in the case of Schamberg and Greenbaum (7) five days, in Spillman's five weeks, in Beeson's (8) patient about three weeks after the completion of the treatment. It is noteworthy that in the patient of Raymond and Lejonne (6)—accidental poisoning from five grams of Paris green—the paresthesias began to show eight days and the paralysis about sixteen days after the accident. The interval here was thus of the same duration as in our case.

Whatever the explanation for the origin of neoarsphenamin nerve lesion, the prognosis is fairly favorable. The polyneuritis clears up either spontaneously or from treatment with mercury (Spillman's case), or, as it is claimed (Pelissier), even with salvarsan. In our case the treatment was purely symptomatic, and after a more or less prolonged course the peripheral nerves of the extremities recovered fully, while the left facial nerve did not. Its incomplete recovery showed as muscular contractures and associated movements —permanent lesions so common in ordinary Bell's palsies.

In conclusion, we might call attention to one more fact. In many

cases of facial diplegia the etiology, as pointed out, is quite manifest. We might mention traumas of brain (concussion, contusion), syphilis of the meninges, vascular disorders (syphilitic or arteriosclerosis) causing pseudobulbar paralysis, degenerative states leading to the classical bulbar paralysis, and similar conditions. In other conditions the cause lies in some obscure infection or intoxication. In discussing such obscure etiologic factors of facial diplegia, Patrick (9) remarks that no case has been due to metallic poison, except probably one of plumbism casually mentioned by Bury. However, such a possibility should be borne in mind, especially in medico-legal cases, as justly pointed out by Pierre Marie.(10)

REFERENCES

1. Spillman, L. Un cas d'intoxication arsenicale sur aigue à la suite de deux injections intraveineuses de neosalvarsan. Bull. soc. francaise de dermat. et syphilol., **25**:100, 1924.
2. Pelissier, A. L'emploi du 606 dans les affections du syst. nerveux. L'Encéphale, **6**:61, 134, 1911.
3. Ménard, P. J. La palynevrite syphilitique. Lancette Francaise, Gaz. d. Hôp., **84**:1917, 1911.
4. Guieu & Pons. Diplégie faciale. Lancette Francaise, Gaz. d. Hôp., **97**:337, 1924.
5. Solomin, N. I. Case of polyneuritis after treatment with 606 and 914. Mediz. Obozr., **79**:587, 1923 (Russian).
6. Raymond, F., & Lejonne, P. Polynevrite consécutive à un empoisenement aigu par l'arsenic. Rev. Neur., **14**:79, 1906.
7. Shamberg, J. F., & Greenbaum, S. Multiple neuritis with jaundice after the use of neo-arsphenamin. J. A. M. A., **84**:163 (Jan. 17), 1925.
8. Beeson, B. Polyneuritis plus dermatitis exfoliativa following neoarsphenamin. Arch. Dermat. & Syphilology, **2**:336, 1920.
9. Patrick, Hugh T. Facial Diplegia in Multiple Neuritis. Journal of Nervous and Mental Disease, **44**:322, 1916.
10. Marie, Pierre. Discussion in Rev. Neurol., **14**:79, 1906.

POSTENCEPHALITIC RESPIRATORY DISORDERS

REVIEW OF THE SYNDROMY, CASE REPORTS AND DISCUSSION

By Smith Ely Jelliffe, M.D., Ph.D.

of New York

Having had the opportunity to observe for a protracted period a very characteristic example of a postencephalitic respiratory syndrome, and having already called attention to the phenomenology,* from the general standpoint of the relationships of somatic pathology to psychopathology as illustrated by the patient under consideration, the present communication aims to enter into a discussion of this particular syndromy abstracted from the larger frame of the post-encephalitic mosaic.[1]

PART I

Historical Résumé of Clinical Material

Respiratory involvements in the acute encephalitic attack have been noted from the first by v. Economo and even before.[2] In previous epidemics of "influenza," "zona," and situations which must undoubtedly be recognized as having very intimate relations to epidemic encephalitis, they have been seen and recorded, but only during the past epidemic extension may it be said that they have been as carefully and as exhaustively studied.

There can be little doubt that the studies of the past ten years which have been more or less focused upon midbrain and interbrain structures, particularly those upon the basal ganglia, have sharpened the observational power of physicians, particularly neuropsychiatrists, and thus brought into prominence what Strümpell so graphically termed the amyostatic syndromy, heretofore observable but strangely overlooked.

* Jelliffe, S. E. Somatic Pathology and Psychopathology at the Encephalitis Crossroad: A Fragment. Jl. Nervous and Ment. Disease, LXI, 1925, 561–586.

[1] Jelliffe, S. E. Resemblances and Differences Between Epidemic Encephalitis and Schizophrenia. Transactions of the Research Society of Nervous and Mental Disease, Dec. 23, 24, 1925. Paul Hoeber, 1926.

[2] Compare Crookshank, Proceedings Royal Society of Medicine, 1919; this same author's volume on Influenza; Heinemann. Jelliffe, Nervous Affections in Influenza, in same volume, and also Jelliffe, several papers upon Nervous Complications of Influenza; also Leichtenstein's classic upon Influenza. See Aronson's citations of Oppenheim's descriptions and the cases of Dana and Schlapp, Brooks and Janeway.

Concerning this aspect of the psychology of seeing things either too late, or so badly, or not at all in medicine, one may well recall Charcot's comment when Duchenne of Boulogne called attention to his now well known type of Muscular Atrophy. "How does it come about that one could discover an affection which has existed since the days of Hippocrates and then one fine morning one perceives there are people with atrophied muscles?" "Why does one have to be shown a thing twenty times before they can see it?" Charcot asked. Certainly this comment pertains as well to the "newly discovered"[3] epidemic encephalitis syndromes.

With the vast multitude of these acute syndromes we are not here concerned, especially the respiratory ones, which have been very frequent and at times severe, even fatal, from direct involvement of the more vital respiratory nuclei. [See Goldflam's paper to be cited.]

As for the respiratory syndromes which may be discussed as postencephalitic, that is arising either by very gradual stages to a full respiratory modification some months or even years after an attack of some infectious disease, either thought of as "influenza" or "encephalitis," or "unknown," we here purpose giving an extended discussion.

It may be recalled that v. Economo[4] was also one of the first to recognize the chronic types. At the same time it must not be overlooked that "recidive" or "reinfection," or "chronic relapsing" cases of neurological interest have been frequently mentioned by the students of the influenza epidemic of 1889, and Leichtenstein (p. 210) deals with them quite specifically. Thus the syndromes of paralysis agitans, tabes, hemichoreas, hemiataxias, hemiplegias, tremors, myoclonias, multiple scleroses, hyperthyroidisms, dementias, lethargies, psychoses, pseudoappendicitis, and a host of others, were known as following in the wake of the "influenza" epidemic of 1890. It is unnecessary to go over this literature at this time, but the student of history must do this else the present "epidemic encephalitis" will be in danger of strange misinterpretation. With these difficult epidemiological problems, however, we are not here concerned. We refer the interested student to Crookshank's study already cited.

As for the "respiratory types," they can be found in this older literature under the rubrics of hysteria, hysterical tics, cramps, etc., and it is not at all surprising that nearly all of the studies to be here

[3] For an excellent philosophical discussion about lost knowledge and rediscovered knowledge, see D. S. Robinson, The Logical Significance of Rediscovered Knowledge, Journal of Philosophy, XXII, 1925, 346.

[4] Von Economo. Münch. med. Woch., 1919, p. 1311. Wien Arch. f. inn. Med., 1920, Vol. I, Heft 3.

reviewed speak of this conception as having been first thought of when observers were first brought in contact with these phenomena in the present epidemic. Thus Turner and Critchley, in their masterly paper, say " such cases were regarded at first as rare or unusual manifestations, frequently labeled ' hysterical ' in nature." Gradually however, it became realized that disorders of respiration form well defined and important sequelae which may constitute the sole after result, or may on the other hand accompany parkinsonism, mental aberration, sleep disturbance, or any other well recognized sequel.

Many of the older descriptions of hysterical dyspnea show the occurrence of these types of dyspnea. They can be collected in great number if one has the industry or the interest to look for them. Thus to take at random one of the Paris Theses, that of Henri Loubry, on " Contribution a l'Étude des Dyspnées d'Origine Hysterique," 1906, and opening at p. 44, Observation X, one finds a perfect example of a " postinfluenzal "—tachypnea of the type described by recent authors. This patient had bradypnea, tachypnea, apnea with cyanosis; they even did three tracheotomies upon this twenty-seven-year-old individual. His respiratory attacks came on in June, 1905, after an attack of " rhume " in December of the previous year. He had sialorrhea, tetaniform attacks (a la Barker and Sprunt), and opisthotonos (a la Parker cases), etc.

Since it may be a part of the purpose of this paper to discuss these " hysterical " manifestations, Charcot's (1886) " tachypnea hysterique " and Weir Mitchell's (1883–1893)[5] studies on the same subject may prove of special interest later.

Neglecting for the time being the older studies upon these dyspneas, and coming to the " encephalitis " studies, the earliest reports I have found are those of Marinesco, shortly followed by the case of Aronson, and then of Barker and Sprunt, Beriel, Insabato, Kennedy, Hyslop and Davis, and others, all in the year 1921. Hardoin's initial thesis, kindly sent me by Professor Beriel, appeared in this year. These I here present in abbreviated abstract form:

Papin, Denechau et Blanc present very briefly[6] the first observation belonging possibly more in the acute phases than the chronic, hence only mentioned here.

Marinesco[7] reports a number of acute syndromes, but *Case IV* of

[5] Mitchell, S. Weir. Hysterical Rapid Respiration, with Cases, Am. Jl. Med. Sc., CV, 1893, 235. Some of these cases are undoubtedly " postinfluenzal." Lectures on Nervous Diseases, 2d ed., pp. 198 et seq.

[6] Bull. Soc. Méd. d. Hôpitaux, July 10, 1919.

[7] Marinesco, G. Contribution a l'étude des formes cliniques de l'encephalite épidémique. Revue Neurologique, XXXVII, 1921, 1, January.

this series may start this account of the postencephalitic respiratory syndromes. He was a twelve-year-old boy taken January, 1920, with headache and alternating fatigue and agitation. Lethargic crises came on four days later. A month later rhythmic, muscular movements of the upper left and lower right limbs. No intelligence defect. In June he had peculiar respiratory movements apparently associated with other muscular movements. The opposite side of the thorax seemed asleep. There was a definite tachypnea synergized with the biceps contraction of the right side being 41 to the minute, the pulse was 80. The chest movements were not exactly synchronous with the biceps movements occurring about 1/5 of a second in advance. (Pneumomyograph). The respiratory movements were bigeminous after 1–2–3 regular excursions. During the lethargic spells the respirations sink to 22. After two months *both* biceps were contracting at the rate of 41 per minute.

Case VI (p. 18). A sixteen-year-old girl first taken ill in March, 1920, with headaches, fatigue, insomnia, anorexia and constipation. She soon began to have rhythmic painful movements in the arms and by June, 1920, these rhythmic abduction and adduction movements of the arms were accompanied by synchronized respiratory movements at the rate of 52 to the minute. Close examination of the tachypnea shows it to be slightly interrupted at inspiration; less often the expiratory movement is shorter. Bigeminal respirations appear. Dissociated tetanic movements at different rates occur in the biceps and triceps muscles.

Aronson's [8] is the first case report in this country of a postencephalitic respiratory syndrome. It occurred in a boy eight years of age.[9] He had a mild headache and temperature—"influenza," and then an accident, more frightened than hurt, and then after about 5 to 6 weeks developed slight character anomalies. Careful history taking showed he had had a diplopia at the time of his influenza. He then developed a mild parkinsonism in about 6 to 8 weeks and then a protracted and persistent tachypnea, of 45 to the minute, and tachycardia. There were irregular periods in his breathing, a few Cheyne-Stokes and some arhythmic dicrotic periods. Aronson specifically asks whether this will continue and what the boy's fate will be and mentions never having heard of a persistent "tachyrespiria." [1]

Barker and Sprunt's case, reported in May, 1921,[2] and Beriel's[3] short note before the second annual reunion of the Paris Neurological Society in June, 1921, are next in chronological order.

[8] Aronson, L. S. Encephalitis with Unusual Sequelae. Neur. Bull., III, 1921, 113, March.

[9] Delayed birth—"blue baby"—of interest in reference to discussion of Birth Trauma of Rank, discussed by me in Journal of Nervous and Mental Disease, June, 1925.

[1] Turner-Critchley write of this boy's recovery after seven months. This case has not recovered according to personal communication of June, 1925, and has developed some interesting regressive character anomalies.

This interesting case report of **Barker and Sprunt**[2] first presented in May, 1921, before the Association of American Physicians, which when studied with our own case, the work of Rosett on Hyperpnea and with the study of Adelsberg and Porges[3] offers extremely suggestive material concerning the neurology of metabolism.

The patient was a young man of eighteen; he had "hard attacks of breathing," difficulty in sleeping and "slipping spells." The history given is very detailed and extensive, of which the authors themselves make the following summary:

(1) Postencephalitic state with petit mal attacks, functional paroxysmal hyperpnea, and a single spontaneous attack of tetany.

The chief features of interest in the present connection are the acute hypomaniacal symptoms of the onset with diplopia, and fever in January, 1920. Later there were attacks of hyperpnea which in February, 1921, are described by the authors as "very deep and labored respirations, the accessory muscles being brought forcibly into play." This breathing does not interfere with the patient's talking. The paroxysms lasted from 2 to 3 minutes. The attacks were divertible. He had many pimples on his face. During the examination made by Barker there was a definite bilateral carpal spasm, persisting for 15 to 20 minutes (Fig. 1). There was no involvement of the feet as did occur in Jelliffe's case. Chvostek but no Poole-Schlesinger leg sign.

The authors discuss especially the relationship of the tetaniform spasm to the hyperpnea and lay much stress upon what they term the "psychoneurotic element." This paper deals particularly with the tetany and states that it is among the first to be reported. [See observations made upon "hysterical dyspnea" with "tetany" in Loubry's 1906 thesis, p. 44 et seq. 47, and Hall's retrospective note, p. 5, of a case seen by him in 1903.]

A general paper contributed by **Barker**[4] later summarizing some of the more striking sequels or "residuals" of encephalitis, occurring in at least 70 per cent of the attacks. He here mentions Aronson's case and one observed by himself and Sprunt (see previous case) of tachypnea with tetaniform attacks.

Beriel[5] demonstrated a case at the second annual reunion of the

[2] Barker, L. F., and Sprunt, T. P. A Spontaneous Attack of Tetany During a Paroxysm of Hypernoea in a Psychoneurotic Patient Convalescing from Epidemic Encephalitis. Endocrinology, VI, 1922, 1. Tr. Am. Physicians, May, 1921.

[3] Adelsberg and Porges. Die neurotische Atmungstetanie, eine neue klinische Tetanieform. Vienna, 1924.

[4] Barker, L. F. Sequelae of Epidemic Encephalitis. N. Y. State Jl. Med., XXII, 1922, 251, June.

[5] Beriel, M. I. Troubles Respiratoires. Rev. Neur., XXXVII, 1921, 640, June.

Paris Neurological Society in June, 1921, of which a short abstract deals with respiratory disturbances in the acute phases and also with postencephalitic attacks of dyspnea related to the rigidity of the body musculature is given in the report of this meeting. He mentions these respiratory difficulties as having occurred in three of thirteen cases. These showed very rapid respirations, 60 to 80, and *superficial*. Salivation was also present. He believes that the evidence favors the peripheral origin of this dyspnea, and it seems to be relievable. He calls it a miscropnea (certainly not comparable to Jelliffe's case in this respect) and he deals with it as a compensatory phenomena.

In this same year, 1921, one finds a brief note by **Krambach**[6] (page 200) in a discussion of anxiety in a polemic with Schultz (Berl. kl. W., 1921, p. 245) saying that a case II had a marked anxiety state accompanying a feeling of air hunger with forced inspirations. These occurred in a fifty-three-year-old man and came on a year after his encephalitis.

An interesting study by **Insabato**[7] given at the Italian Congress of Neurology, October 19–21, 1921, deals primarily with the subject of alterations in character in the psychical symptomatology of epidemic encephalitis, hallucinations specially, and is finished by a brief note on "respiratory disturbance in postencephalitis cases."

Insabato speaks of them especially as relevant to the aspect of psychogenesis, utilizing the older concepts of "functional" and "organic." Many neurasthenic states, many changes of character, many postencephalitic nervous disturbances, thought to have had no organic basis were thrown into the pithiatism group.

The author cites very briefly four instances of postencephalitic character changes. *Case 1:* Seventeen years old. Accessions of dyspnea coming on without apparent cause and giving rise to great oppression and anguish. They last a few minutes only.

Case 2: Fifteen years of age. Attacks of dyspnea arising upon emotional contact, such as lively talk with a companion, a notice—lasting some time and giving rise to a state of gasping in which the patient grasps hold of any object or any person as an anchor of safety.

Case 3: Thirty-two years old, a month after an encephalitis, with mild general rigidity. Several attempts at suicide. Has a profound sense of being ill, has salivation, with attacks of dyspnea, whenever he sees the physician, or is under observation.

Case 4: Forty-eight years of age. These dyspneic attacks are reported as conditioned by the physician or by general emotional conditions.

[6] Krambach, R. Dauersymptome und amyostatische Krankheitszustände nach Enzephalitis. Monatsschrift f. P. u. N., 1921, L, 189–201.

[7] Insabato. Breve considerazioni su di un peculiare disturbo respiratorio nel postencefalitici. Riv. d. pat. N. u. M., XXVII, 1922, 75–93. Italian Congress, Oct. 19–21, 1921.

"Encephalitis, with its imperceptible transitions from distinctly organic to distinctly functional disturbances, cuts in my opinion the Gordian knot of the problem, reducing the two terms to their true value, namely, that of being opposite and yet complementary viewpoints, of which our mind cannot rid itself in the study of the actual biological unit." This is his concluding remark.

Among the cases reported by **Kennedy, Davis and Hyslop**[8] before the Research Society of Nervous and Mental Disease in December, 1921, published in July, 1922, they speak of the disturbed breathing in two and mention briefly a third.

Case H. G. Ill in December, 1918, with influenza (?). Severe headache and intense sleepiness day and night with reversal of sleep mechanism after three or four weeks. Seen in the spring of 1921 he had some parkinsonism, great inability to do things. Great anxiety on effort, shivering attacks and respiratory disturbances. These attacks lasted from 15 to 30 minutes. During them he felt as though he could not fill his lungs with air, and he breathed with all of his accessory respiratory muscles from 56 to 64 times a minute. At other times he experienced what seemed like a spasm of the laryngeal muscles and breathed more and more stertorously and ineffectively so that the lips were cyanosed and the eyes protruded. Phenomena such as these have appeared at times in hysteria, and various physicians have considered them as hysterical in this case. This explanation would not account for the patient's abnormal thirst for ice water. He consumed for a period of 18 months, between 30 and 40 quarts of water every day and had proportionate polyuria. [Compare with case of Jelliffe.]

Case 2. (p. 42) A boy of fourteen had his acute attack of encephalitis in January, 1920. There was an apparent recovery for many months. He then developed polydipsia and polyuria with tremors in the upper extremities, excessive salivation and distressing paroxysmal attacks in which breathing was exceedingly rapid, labored and difficult, quite similar to the preceding patient.

In the discussion the authors note: "Breathing spasms were seen twice. One patient, E. P., just mentioned, had had from the beginning very irregular breathing—both in depth and rate—accompanied by curious noises which occurred only during sleep. S. J., fifteen months after apparent total recovery from encephalitis, had a parkinsonian relapse, accompanied by attacks of rapid deep breathing. These increased in frequency and at length continued through the waking hours, causing much fatigue. Emotion would initiate them, but when started they could not be stopped until their course was run—usually in a minute or two. There was never any feeling of dyspnea, but a sensation that the

[8] Kennedy, F., Davis, T. K., and Hyslop, G. H. An Additional Contribution to the Symptomatology of Epidemic Encephalitis. Am. Archives of Neur. & Psychiatry, VIII, 1922, 40, July.

lungs could not be filled, and he had a desire to expand them as much as possible."

In **Ponticaccia's** [9] communication the author refers to attacks of dyspnea in one of his postencephalitic myoclonic patients.

Hardoin's [1] thesis calls for definite mention in that his is the first monographic study devoted to the clinical types under consideration. Having had in mind the idea of studying the whole parkinsonian symptomatology Hardoin tells us he was dissuaded from so vast a project by Beriel and limited his study to this as yet little known form.

Hardoin speaks of the febrile dyspneas of the early stages, already much discussed in the acute periods by Rollet, v. Economo, Marie and Levy and a host of others. He then takes up those respiratory difficulties of the chronic stages (p. 17) discussing forms of tachypnea and respiratory tics. Two cases are reported one conditioned by a diaphragmatic myoclonia, the other more difficult to interpret. In his general résumé he cites 10 observations. (1) Marinesco's case of March 16, 1920—an acute fatal case—death in 3 weeks. (2) Case of Roubier (These Verdet) also an acute fatal case after five weeks. (3) Papin, Denechau et Blanc. Dypneic crises with cardiac irregularity coming on at night which appeared one month after the acute onset and later disappeared—4 months (here noted). (4 and 5) Marinesco's cases here reported. (6 and 7) Beriel's cases here cited. (9 and 10) His own 2 cases.

Case 1. A married woman of thirty-two with acute encephalitis in February, 1920. A month later she felt oppression in her breathing and by May she had established a constant form of attack which usually began every afternoon between 5 and 6 and persisted into the early hours of her sleep. She had a tachypnea of 80 to the minute, very superficial, but interspersed with deep inspiratory movements. These had persisted up to some time in August even though her general state was much better.

Case 2. A married woman of twenty-seven. Encephalitis (7 months pregnant) in January, 1920, recovery from acute stage, accouchement March normal. Then by January, 1921, gradual development of parkinsonism. Then a persistent tachypnea marked and almost continuous—60 to the minute (pneumographic tracings).

Following the chronological lead, a number of studies appear in 1922, led by Goldflam's (January) interesting résumé of the great encephalitis epidemic in Germany of 1920. Then appear papers by Pardee (February), Hoover (April), Francioni (May), Bilancioni and Fumarola (July), and the initial studies of Marie, Binet, and

[9] Ponticaccia. Postumi dell 'encefalite epidemica. Giornali di Clinica Medicina, X, 1921.

[1] Hardoin, B. Etude des Troubles Respiratoires dans les Etats Parkinsoniens lies a l'éncephalite épidémique. Dijon, 1921.

Gabrielle Lévy (July), which culminated in Mlle. Lévy's classical monograph. Then the reports and studies by Capgras and Reboul Lachaux, Parker, Lewy, Vincent and Bernard, Roubinovitch, Baruk and Bariety, Robin, Babinski and Charpentier, Souques and Bouttier, abbreviated abstracts of which follow:

Goldflam's [2] contribution dealing primarily with the acute symptomatology speaks particularly of the continuance of the early respiratory symptomatology into later stages of the disease (p. 60). Frequent breathing, apnea, Cheyne-Stokes respirations, irregular breathing with yawning, paroxysmal attacks of polypnea, 50 to minute, with dyspneic feelings, anxiety and cyanosis are noted. Nasal paresthesiae are quite frequent with these respiratory attacks and nose boring is quite striking. (p. 62) Goldflam notes "We have localized the tachypnea occurring in the beginning of the disease to a spreading of the process to the breathing centers in the floor of the IV ventricle. We have been able to localize the process there in cases of death due to respiratory paralysis. At first sight the occasional extremely grotesque respiratory disturbances of children gave the impression of a secondarily arising "ausgepropften" neurosis all the more so since no hindrance to breathing or objective sign of dyspnea, cyanosis, etc., were present and in many cases the respiratory disturbances seemed under the mental control to a certain extent. One fact alone, however, that at times a tachypnea (30–40 to the minute) would persist even during sleep negatives this opinion and decides in favor of the organic lesion in the neighborhood of the respiratory center.

Goldflam cites (p. 62) a case of bradypnea (12 to minute) in a thirty-five-year-old man showing 15 months after the encephalitis.

Pardee [3] mentions having seen a postencephalitic case of continuous tachypnea such as Aronson's, but calls particular attention to the paroxysmal type, five instances of which had come under his observation. These attacks begin gradually and mount in their intensity, the breathing becoming faster and deeper as in Jelliffe's case. Inspiration is long and deep and so is expiration, ending in a grunt. Distress and anxiety accompany the attack. They clench and unclench the hands, the musculature becoming tense or rigid, and bending forward or backward may occur. In two of his cases an apneic phase with cyanosis supervened. One almost showed convulsive phenomena. The paroxysms lasted five to fifteen minutes, three or four times daily and often just before sleep at night.

One case history is given of a man of twenty-two with a severe cold in February, 1921, with slight lethargy. Later sleep formula inversion. A coughing respiratory tic developed soon after his illness and several

[2] Goldflam, S. Die grosse Encephalitis epidemie des Jahres 1920. Deut. Zeit. f. N., LXXIII, 1922, 1.

[3] Pardee, I. H. Spasmodic Forced Respiration as a Sequel of Epidemic Encephalitis. Jl. Am. Med. Assoc., LXXX, 1922, 179, February.

months later the paroxysmal respiratory cycle began. They lasted about five minutes and consisted of deep fast respirations, chiefly through the mouth, with distortion of the facial expression and use of the accessory respiratory muscles. Expiration was forced and accompanied by a noisy cough-like grunt. Pardee would incline to a thalamic localization for his explanation of a part of the situation.

Although **Hoover's**[4] case does not strictly pertain to the groups herein considered its clinical features are so closely related that it seems desirable to include it in the series.

The patient, a man of thirty, had a meningoencephalitis in December, 1920. He slowly developed a parkinsonian facies with no other residuals. In February, 1922, he came to the hospital for a difficulty in breathing. Every inspiration was blocked and the harder the effort the greater the difficulty. He developed great anxiety over his peculiar dyspnea which was worse with effort. Close scrutiny showed that there was a paralysis of the dilatores and compressores alae nasi which accounted for the inspiratory difficulty.

Francioni[5] in his first paper calls attention to Mendicini's interesting pneumographic studies of respiratory alterations occurring in the acute phase of encephalitis. The respiratory quotient tends to be modified in that inspiration is greater than expiration and that interruptions in the rhythm are constant, although not periodic properly speaking. Beriel's study is alone known to him and commented upon.

His own case is of a seven-year-old girl who had an encephalitis in September, 1919. Respiratory symptoms were noted from the beginning. She came under observation in April, 1921. The respirations were rapid and ample. By a strong effort she could control these rapid and deep breathings but only for a short period. The attack is characterized by an increasing rapidity of respirations. This tachypnea is followed by a period of apnea associated with spastic tonic contractions of all of the general and accessory muscles concerned in inspiration and expiration. At the beginning of this apneic period, she spreads her feet apart and bends forward grasping her legs behind the knees and remains in this position for a few minutes making forced expirations. (Photo.). The respirations have been up to 55 or 60 a minute. This is followed by a phase in which she straightens out, brings her right hand to her neck, throws her head back and makes a violent effort at inspiration, the face being congested, cyanotic, and hemorrhagic, the eyes immobile, the veins in the neck turgid and injection of the conjunctiva and even epistaxis may result. In the tachypneic phase the cardiac action is rapid; the heart stops in the apneic phase.

[4] Hoover, C. F. Inspiratory Dyspnea Due to Paralysis of the Dilators of the Nares Following Acute Infectious Meningo-encephalitis. J. A. M. A., LXXVIII, 1922, 966, April 1.

[5] Francioni, G. Sindrome bulbare vago-ipertonica nel corso dell encefalite letargica. Il Cervello, I, 1922, 145, March, June.

The author discusses at length the pseudoproblem of the psycho vs. somatic pathology, allying the situation with Gilles de la Tourette's disease (also see de Saussure's handling of the same situation), and then takes up the problems of localization of this vagohypertonic syndromy following Laignel-Lavastine for the terminology and Eppinger & Hess for the general conception.

Case 2. A girl of eleven years came to the clinic while the report of the first case was in print and is added. The history resembles very closely that of the first patient and does not need repeating (pneumographic tracing and pictures).

Bilancioni and Fumarola[6] have made a very complete study of 10 cases with excellent pneumographic tracings almost the only study save those of Mlle. Lévy devoted exclusively to the respiratory anomalies. Having as senior collaborator an otolaryngologist, Bilancioni, the emphasis was laid upon the changes in the respiratory tract. The vocal cord movements are minutely gone into. In general they are described as resulting in a certain torpor of abduction and adduction (rigidity, J.) of the vocal cords, and are referred to mesencephalic implications. Lasagna has studied them exhaustively, also Favine—especially in the acute stages of encephalitis.

The present study is chiefly restricted to the postencephalitic phenomena as affecting the larynx and respiratory apparatus. As with the type of paresis of the labioglossolaryngeal apparatus so also the respiratory phenomena shows a paroxysmal arhythmia. Epidemic hiccough is one of the most interesting of the phenomena under consideration. This is related to a rhythmic clonus of the diaphragm. Mendicini is quoted as one of the investigators of the respiratory anomalies, especially studied during sleep.

Case 1. A barber thirty-two years of age, January, 1920, encephalitis, oscillating fever for a month. A year later, especially at night, he showed attacks of anxiety with rapid respirations. (Pneumographic tracings.)

Case 2. A woman of twenty-eight with fever, headache and lethargy in February, 1920, which lasted about a month. She developed a diplopia and after 5 months showed tremors, salivation and other postencephalitic symptoms. No notable respiratory signs.

Case 3. A nineteen-year-old contadino who had influenza in October, 1919, lasting some weeks. In April, 1920, began to have constriction in the throat and dyspnea. Insomnia, agitated and respiratory crises of about 2 to 10 minutes duration. Sleepy in daytime. The pneumographic tracing showed marked abdominal alterations quite incommensurate with the thoracic ones.

[6] Bilancioni, G., et Fumarola, G. Su alcune rare manifestazioni, a forma bulbare (laringee e respiratorie), della "encephalitis chronica epidemica." Ann. di. Med. Navale, 29, 1922, Vol. II, 1, July, August.

Case 4. Patient forty-four years of age, attacked with influenza in 1919. In January, 1920, a psychomotor agitation, delirium and fever. Influenzal bronchopneumonia was the diagnosis with recovery after a month. After this a period of rigidity in the muscles of mastication, sense of constriction in the throat and respiratory anxiety. In this patient there was a marked diaphragmatic arhythmia with some interesting anomalous nasal breathing records.

Case 5. A schoolboy of fourteen who had a fever, diplopia and lethargy in October, 1919, lasting a few days. Then he had violent attacks of coughing, followed by dyspneic spells which persisted about a year. The respiratory attacks were characterized by a steadily augmenting rapid and deep breathing (48–50 to 70–80) with all the nasal, buccal and accessory respiratory muscles in operation (quite similar to X of the present communication). There was no cyanosis and the length of the attack was quite variable.

Case 6. Fifteen years of age, always well, when one night in February, 1920, had a period of psychomotor excitement which repeated itself a couple of nights. The third day a diplopia with lethargy which soon passed. In June, 1920, incapable of applying self to work, no interest in surroundings, slow movements. Later typical parkinsonian facies. Changes chiefly rhinoötolaryngological of parkinsonism.

Case 7. A thirty-seven-year-old woman who in January had a psychomotor encephalitic onset with fever and insomnia at night, with gradually advancing motor stiffness. Three months later dyspneic attacks with a rapid breathing, noisy inspiration and expiration, lasting an hour or so, most marked at night. Salivation was pronounced throughout the crises (100 to 150 gm.). Typical pneumographic curve.

Case 8. A thirteen-year-old schoolboy. Encephalitis in 1919 with moderate fever for 3 to 4 days, amblyopia 5 days, lethargy, in daytime and agitation at night. Dyspneic crises, chiefly expiratory 70 to 80 to minute with coughing attacks, and modification of the voice. He had 20 to 25 of these attacks a day, lasting 3 to 5 minutes each; salivation occurring with the acme of the attack.

Case 9. An eleven-year-old girl. February, 1919, fever, vomiting, unrest, later nocturnal psychomotor agitation, sleepy in daytime. Fever ceased after 2 weeks. Three months later laryngeal attacks, and later in December respiratory hyperpnea in which she had her mouth half open filled with saliva.

Case 10. A twelve-year-old boy who first showed somnus inversus. Agitated at night, sleepy in daytime. This subsided after several months, but still showed traces of the inversion. After about a year he showed hyperpneic attacks with involvement of the accessory muscles. This patient showed a Chvostek sign.

These 10 cases, 7 men and 3 women all showed postencephalitic respiratory involvements. The authors call attention to Weir Mitchell's study of 1883, differentiation of asthma from hysterical dyspnea.

Four cases are described very briefly by **Marie, Binet and Lévy,**[7] under the captions:

(a) Respiratory troubles per se, (b) spasmodic coughing, (c) respiratory tics.

(a) Polypnea, or tachypnea—with apnea or bradypnea. Paroxysmal polypnea—in crises—impossible to systematize, frequently in evening—5 o'clock or with nightfall—especially manifest in children—last less than an hour, several hours or the entire night: permanent.

Respiratory tics: describes associated with respiratory crises: with or without them. Nasal, buccal.

These are expanded in their complete discussions.

After calling attention to a number of studies upon respiratory disturbances in the acute stages of epidemic encephalitis, **Marie and Lévy,** [8] here develop their earlier contributions with Binet (Soc. med. d. Hop., July 7, 1922) upon respiratory sequels of the encephalitic process. They deal with the manifestations under three main groups: (1) Respiratory difficulties per se; alterations of the respiratory rhythm, chiefly polypnea (tachypnea), bradypnea, apnea, irregular breathing; (2) spasmodic cough, hiccough; (3) respiratory tics and rhinolaryngeal anomalies of sensation. As to the respiratory disturbances per se, polypnea is the most frequent with or without bradypneic or apneic phases. Cheyne-Stokes breathing they say they have not observed up to the time of the report. The rapidity varies from 48 to 80 per minute. This rapid breathing may be persistent or paroxysmal, the latter being the rule. In children particularly the attacks tend to fall about five o'clock or nightfall and may last but half an hour or all night. No special cause is ascertainable. Emotional disturbance is a frequent starter. The objective disturbances are frequently accompanied by sensations of suffocation, distress and constriction of the chest, which with no edema or asystolic phenomena or true anxiety. (True anxiety is a frequent accompaniment. J.)

The permanent polypneas are usually accompanied by slower breathing, 20 to 30, and often is not observed. Paroxysmal crises come on with these patients. Smallness and irregularities of the pulse, fall of arterial tension and cyanosis and cold extremities are observable. Tendencies to deep sighing, to stoppage of breathing and to periodic breathing are noted and illustrated. They have noted but one case of bradypnea or apnea. (Soc. de Neurol., May 4, 1922. Rev. Neur., 1922.)

In Case 1 there were periods of apnea following a period of rapid breathing (see our Case 10). Various nasal, buccal, and laryngeal sensations often accompany the attack; these cause various abortive or com-

[7] Marie, P., Binet, L., and Lévy, G. Les troubles respiratories de l'encephalite epidemique. Bull. et Mém. Soc. des Hôp., XLVI, 1922, 1075, July 7.

[8] Marie, P., and Lévy, G. Deux manifestations particuliere de l'Encéphalite Épidémique prolongée: Forme Respiratoire Forme Insomnique. Rev. Neur., 1922, XXXVIII, 1233.

plete tics, accompanied by sniffling, blowing, puffing. Much mucus may accumulate in the nose. In case 3 a parkinsonian syndrome developed.

The second part of this paper deals with the insomnia forms of post-encephalitis.

Case 1. Thirteen-year-old girl. Undiagnosed encephalitis in January, 1920, with delirium, chorea, and myoclonus. Lethargy until June; whooping cough-like attacks for a year; then nasal sniffling, salivation, and spitting; then in August, 1921, crises of rapid breathing—thirty-five to minute (pneumograph II). Apneic for a few seconds at intervals, with sighing and moments of anguish, suffocation. Coldness and cyanosis of extremities.[9]

Case 2. Patient twenty years old. January, 1920, nondiagnosed febrile period, headache, delirium; six weeks later compulsory vomiting, later followed by obsessing desire for evacuations. November, 1920, respiratory crises began, with cessation of gastrointestinal activities. Respiratory crises at first paroxysmal, later permanent. Polypnea forty-one to minute, ceasing on distraction with irregular rhythm (pneumograph). Hands cold, cyanotic, and moist.

Case 3. Fourteen-year-old with nondiagnosed encephalitis in March, 1920, headache, diplopia, day-night reversal. Whooping cough-like attacks came on eighteen months later, incessant and persistent; polydipsia and polyuria. Abortive parkinsonian.

Case 4. Boy, thirteen years old, with nondiagnosed encephalitis with psychomotor agitated onset. Sleep rhythm reversed. Nasal sniffling tics began ten months after the onset. Symptoms persisting two years, with amelioration of a parkinsonian attitude.

Cases 6 and 7. Ten-year-old and nine-year-old boys, respectively; chiefly insomnic form, with intermittent rapid breathing attacks. Tendency to brutality requiring internment of patients.

Dr. Gabrielle Lévy's[1] study is the first thorough presentation of the general problem which concerns us in this communication. She has studied and here sets forth in detail her observations of 129 cases of various forms of post-encephalitic disorder, ten of which are most definitely concerned with post-encephalitic respiratory types. This thesis is the parallel of the studies of Marie, Lévy and Binet, and Marie and Lévy herein referred to, and from the material here studied and the general survey of the literature Dr. Lévy has created the special categories which have been referred to in the abstracts already cited. The thesis collects and amplifies a number of studies begun by Dr. Lévy in the Salpetriere under Professor Marie from 1918 onward. In the present thesis the detailed observation of 68 of the 127 cases studied are given, pp. 175

[9] Especially interesting case from standpoint of transition from oral cannibalistic-sadistic-anal erotic phase to respiratory phase of libido expression, speaking psychoanalytically.

[1] Lévy, Gabrielle. Contribution a l'Etude des Manifestations tardives de L'Encéphalite Épidémique (Forme prolongée et réprises tardives). Thése de Paris, 1922, No. 439. Vigot Freres, Paris.

et seq. It is unquestionably one of the ablest of the many studies upon encephalitis.

We purpose abstracting here only briefly some of the cases in which the various types of tachypnea are recorded.

Case 35, p. 227. Male, thirty-five years of age, who had the lethargic neuralgic and eye palsy symptoms in February, 1920. He developed a tremor of the left arm by March, and salivation, stiffness in mastication, and then a gradual slight parkinsonism. In addition to a monotonous, jerky, explosive difficulty, he also had rapid and jerky breathing, 30 to the minute, with rapid heart action, 112. He made an apparent complete recovery after thirty months.

Case 37, p. 229. Male, twenty-nine years of age. In December, 1919, he noted he was always sleepy; he saw double at times and his vision was often foggy. In May, 1920, insomnia was pronounced. In August he had the sensation of being full of air, and would puff or blow. This would come on in periods of fifteen minutes or so every day. These crises became more frequent and would last longer, being almost constant by October and persisting until January, 1921. This tachypnea was intense and noisy. With intense effort the rate could be reduced—at periods of calm to 22 to the minute. The tachypnea would persist even during sleep. He had other symptoms, and at the end of two years was not improved.

Case 60, p. 272. A girl six and one-half years old with profound lethargic symptoms in March, 1920, following a short delirium. She lay in coma fifty-five days, with complete loss of visceral and rectal control, and with diaphragmatic myoclonic spasms. Coming out of her coma, she had periods of almost maniacal agitation, in which state she was received for observation. In these periods she was beside herself, spit in all directions, and at times stuffed her feces in her mouth, urinated in her mouth, and was coprolalic. (Compare with so-called "degeneracy" symptoms, obscenities, etc., of Case of Jelliffe.) These crises would clear up and the patient, apart from a marked emotivity, seemed quite clear. By January, 1921, most of the severe visceral regression symptoms had cleared up. She also showed an almost continuous sniffling, which would advance to a marked degree of forced and blowing expirations, with much nasal mucus and much hawking. She was sent to St. Anne.

Case 61, p. 273. A girl of eleven who, in February, 1920, had a short period of hallucinatory delirium apparently(?) related to some ear infection. Temperature, lethargy for a month followed. After this (meningitis—typhoid?) she recovered, with feebleness and with occasional attacks of generalized trembling. In July, sleep and character alterations appeared and she began to make capricious grimaces and eye movements. Then tachypneic difficulties arose. She also had hiccough and yawning attacks. By October, 1921, the paroxysmal tachypnea was pronounced.

(*To be continued*)

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

The Four Hundred and Twenty-Fifth Regular Meeting, January 5, 1926, the President, Dr. I. Abrahamson, Presiding

A CASE OF TUBERCULOSE EN PLAQUE WITH PATHOLOGICAL SPECIMEN

Dr. Irving M. Pardee and Dr. Leila C. Knox
(by invitation)

[Authors' Abstract]

A case history was presented of a young woman twenty-five years old, whose complaint was of attacks of a peculiar feeling of tension in the right arm, some pain, and then a spasm, largely tonic in nature, in that arm. This was usually accompanied by considerable psychic unrest, a hysteroid reaction with anxiety, and there was rarely loss of consciousness. These attacks were repeated at infrequent intervals, sometimes every two to three days, and then every month. During the first period of observation, five years ago, she showed as physical signs only a persistent hyperreflexia on the right side, with only once an unquestionable Babinski, and rarely a tendency to clonus. The combination of a hysteroid personality with the paucity of neurologic signs precluded a positive opinion, and the patient was discharged from the hospital with the diagnosis of a possible left cortical tumor. A period of four years then elapsed, and when the patient again came under observation she showed unmistakably the well developed signs of a tumor in the left precentral area. She died a few days afterward and an autopsy was performed.

The macroscopic appearance was suggestive of a large, flat, tumor-like mass, spreading from the frontal lobe posteriorly to the parietal region, on to the mesial surface of the brain, and downward almost to the Sylvian fissure. This appeared to be a glioma probably infiltrating in type, being firm and invading the cortex down to the white matter in places. Microscopic examination revealed what is definitely a tuberculoma, with caseation and fibrosis, large and numerous giant cells, and well formed tubercles. It lacks the vascular lesions characteristic of a syphiloma.

A condition similar to this is described in the literature—*meningite en plaque tuberculeuse*—and one previous case is reported exactly similar to our presentation.

The extreme rarity of the pathologic picture, combined with the confusion as to diagnosis, makes the case worthy of reporting.

Discussion: Dr. Abrahamson asked if all the attacks were ushered in by the tonic disseveration of the hand, during which the patient held on to the bed clothing, and could not let go her hold.

Dr. Pardee said: I observed a number of the attacks, and those were ushered in by a tonic spasm of the right hand. They were practically always preceded by a consciousness on the part of the patient of the fact that there was something happening in her arm, sometimes a numbness, sometimes a feeling of tension, and sometimes other paresthesiae. It finally ended up with a definite clonic movement. She was often anxious during the course of the attacks, and obviously in a state of fear and distress caused by the occurrence of the attacks, which attitude dominated at times the organic features of her condition, so much so that an impression was frequently made that they were typically hysterical attacks, and because of the variability in the reflexes we were quite willing to postpone the exploratory operation.

Dr. Abrahamson said that there was a long time, a space of four years, that elapsed until the second time she entered the hospital. At that time did she have all the signs of pyramidal tract involvement, lost abdominal reflexes, Babinski, hypertonia, hyperreflexia, and paralyses?

Dr. Pardee replied: When she came in after that four years' interval her right side was partially paralyzed. She was in a very serious state physically on admission. It was hard to do an examination on her as she was uncoöperative; there was, however, a definite increase of reflexes on the right side, but we could not elicit a Babinski.

Dr. Abrahamson said that the specimen showed a very interesting involvement of the cortex, without involvement of the white matter, and it was possible not to have the Babinski phenomenon or to lose the abdominal reflexes or to have hypertonicity. The next point of interest is that the cortical effects were tonic, since we are dealing with a tonic disseveration. In the vast majority of cases only when the deeper parts are involved you get the tonic spasms. I think this case may throw a very considerable light on the subject, because here we have a very considerable involvement of the cortex and not much involvement of the subcortex—the white matter.

PARALYSIS AGITANS AND THE RIGHTING REFLEXES ("STELLREFLEXE" OF MAGNUS-DE KLEIJN)

Dr. S. Brock and Dr. I. S. Wechsler

[Authors' Abstract]

This communication is a preliminary one, and we hope to enlarge upon it on another occasion. Briefly, our thesis is this: The all essential features of paralysis agitans, *i.e., the posture and defect in the performance of the so-called "associated and automatic movements" are losses of a variety of righting reflex.*

Parkinson's syndrome is a very complicated disease. Tremor is not an essential sign. Its absence is a fairly common occurrence.

Rigidity is a very common finding, varying in its intensity, but there are unusual cases without it. We are not concerned in this paper with tremor or rigidity. The disease does exhibit two absolute essentials: (1) the assumption of a certain well known attitude, and (2) the loss of certain postural adjustments intimately associated with the attitude; these are the "associated and automatic movements." As stressed by Kraus, this posture represents a "dissolution of erectness, an inability to achieve that particular righting concerned with the erect posture in man. In paralysis agitans man's normal bipedal erectness is being replaced by the abnormal quadripedal posture of the lower animal. So much for the static phase. In festination, retropulsion, and lateral pulsion we see this same inability to "get set," this loss of righting, when a change from one posture to another is attempted.

As man assumed the erect posture, he elaborated his emotional life at the same time, and the righting reflexes became intimately concerned with the motor expressions of emotion. Facial movements of anger, fright, surprise, etc., were correlated with corresponding somatic postural patterns—the latter falling into the category of righting reflexes. So fusion of the latter with the facial expressions of emotion occurred. One might say that facial emotional movements are affective motor expressions of certain righting reflexes which have acquired an emotional component in man. Hence the concomitant lack of emotional expression in paralysis agitans.

The absence of rigidity in certain cases shows that hypertonus cannot be invoked as a cause of the loss of these righting adjustments.

In Magnus' monograph, "Körperstellung," various righting reflexes are defined and described (1, labyrinthine; 2, optic; 3, neck; 4, body on the head; 5, body on the body), differentiated by the *afferent* pathways transmitting the stimulus, and the location of the centers. A righting reflex may be defined as a coördinated movement which tends to restore normal posture from any abnormal deviation imposed on the animal. Such righting adjustments are always present in the walking state, because minute deviations from normal posture are constantly at work. The great rôle of the head (with its great sensory receptors) is to be stressed in the initiation of these reflex movements. In general, the centers are in the midbrain and interbrain. Of course, the centers for the optic righting reflex are in the cerebral cortex. Other righting reflexes occur, viz., those initiated by smell, those dependent on psychic processes in the cortex, etc. The actual center for the righting reflex concerned in the maintenance of the erect posture and its allied reflex postural adjustments is unknown. It may be placed in a hypothetical locus in the diencephalon.

Discussion: Dr. Walter M. Kraus said: In the twelve years during which I have had the privilege of attending the meetings of this Society, I do not believe that I have ever heard a paper whose future significance and present value to organic neurology is greater than this. The subject is one of the most difficult of organic neurology, for it demands a very intimate knowledge of neurophysiology

and of reflexes in the sense of Sherrington, rather than in the sense of Hughlings Jackson. Sherrington worked in the direction of building up reflexes from the spinal level; Hughlings Jackson worked on the question of the release of reflexes by lesions of upper levels.

First I shall touch upon the beginning of the paper dealing with the matter of tone. Dr. Brock has stated that a transsection of the cord will produce flaccidity. He has also emphasized that a section higher up will permit decerebrate rigidity. Let us consider the question of the suprasegmental centers. From purely clinical experience of your own, you will recall the effects of the lesions of various suprasegmental ganglia, and you can see very clearly that all of them have the influence of controlling and inhibiting tone. These include lesions of the globus pallidus, the red nucleus, the substantia nigra, and of the frontal and temporal lobes. A vast accumulation of experimental data from Sherrington's and other laboratories shows that tone is essentially inhibited above the segmental system, and that it is produced below the segmental system.

Tone, as Sherrington has emphasized, apparently without universally adequate success, is produced in muscles. It is not produced anywhere else. It comes in through the afferent roots, flows into the spinal cord, and then is distributed.

Tone does not originate in the labyrinth. If both labyrinths are destroyed in an animal there is no change in tone. If one labyrinth is destroyed there is a change in tone in the neck muscles on the same side. It is, however, secondary to a stretching reaction in the neck muscles themselves, and is a postural change in these neck muscles, due to a unilateral postural influence of the labyrinth, and not a primary tone change. The head rotation remains even if the sensory cervical roots from the muscles causing the rotation are cut. The influence therefore passes via the anterior roots. The unilateral removal primarily alters head posture. This entails a stretching reacting on one side with tone genesis, and tone redistribution between the two sides.

The next problem is that of posture. I have stated in 1921 and in 1923 that it is my firm belief that the patterns of the leg postures concerned with the movement of walking in man are quite spinally determined. Kinnier Wilson was good enough to agree with me in his address to the American Neurological Society several years ago. I think there is no question that a careful reading of Magnus shows that he also is of the same opinion, that the patterns for the muscular action of the legs in walking are in the spinal cord. In tetrapods the same applies to the arms. These postures are extension and flexion of the leg, and the corresponding postures in the arm. If there be a lesion about or below the midbrain, the posture of decerebrate rigidity results. If there be a lesion higher than the midbrain, an entirely different posture of the arm results. In a paper which will soon appear I state some of the reasons why the postures of the suprasegmental levels, arm postures like those of classical hemiplegia, parkinsonism, and pseudobulbar palsy are so located.

With this in mind, let us pass to another question, that of erect-

ness. When there is a lesion in the location of that which produces Parkinsonian disease or pseudobulbar palsy, there results *dissolution of erect posture.* The center for the ability to right, to resume the erect posture, which is lost in parkinsonism, is located above the midbrain. This has been observed before, but what has not been observed, and what constitutes the importance of Drs. Wechsler's and Brock's paper, is that this lost reflex is a righting reflex, a "stellreflexe," in the sense of Magnus and de Kleijn.

Now let us see whether Dr. Brock's localization of the center for this righting reflex which is diseased in Parkinson's is borne out, but from an entirely different point of view. Elliott Smith, in "The Evolution of Man," states that the receding of smell and the development of sight largely determined the appearance of the primates. In other words, as the olfactory sense diminishes, sight becomes more and more evident. As the eyes come from the side of the head, as they are placed in a rabbit, to the front of the body, there is a change in the optic chiasm. Lower animals have completely crossed optic tracts. As we ascend, the crossing becomes less and less complete, until in man the crossing is but a half one. The most important recent work on that subject has been contributed by Brouwer and Hunter, and you might be interested in Brouwer's[1] studies.

Convergence of the eyes and the power of accommodation are developing *pari passu* with the half-crossing of the optic nerves. Further, the macule is bilaterally represented. As the eyes of the animals which are placed each on one side come in towards the midline, there comes a stage where both eyes see one object. This is the beginning of the need for stereoscopic vision. Riddoch showed that the recovery following occipital lesions produced a curious train of events: first, the patient could see moving objects only, and later only their stereoscopic appearance, which suggests a recapitulation of the phylogenetic development. Now the animal on all fours, who cannot maintain erectness, desires to see more rapidly. Obviously turning is more difficult when on all fours than when erect. Erectness ensues gradually and finds its highest expression in the most highly civilized man.

There is another factor. The posture of the prehensile arm, which, as I have already described elsewhere, is produced by ventral muscles, I have placed above the midbrain. The reasons I have given you earlier in the evening. At about the same level, *i.e.,* supramesencephalic, I have placed the center of erectness. The gradual development of stereognosis in fore limbs (hands) and eyes requires a new receptive nucleus on the afferent side, and this must lie about the region of the thalamus. It is about this region on the motor side that I have placed the two centers for prehensile arm and erectness, the latter of which is diseased in parkinsonism. These motor centers correspond to the new sensory stations which I have mentioned.

This brings up still another and very important aspect of the paper of Drs. Wechsler and Brock. This is the neurobiotactic. In

[1] See Jelliffe and White, "Diseases of the Nervous System," 4th Ed., p. 355.

lower animals the center for standing lies below the midbrain. In man it lies above. Something has caused it to appear at a higher level in man. *Pari passu,* we know that the center for extension of the legs lies prespinally in man and apes, intraspinally in lower animals. Therefore, it also has gone cephalad in apes and man. This later reflex produces *leg extension,* the reflex at the bottom of erectness has as its main function *extension of the trunk on the legs.* It seems to have been drawn cephalad in man—but to what? Why should a center for stereotyped posture be located so high above the spinal cord? What neurobiotactic influence is at work? Is it the new type of vision and its result, complete erectness? I believe so. Drs. Brock and Wechsler have described as a righting reflex, a stell reflex, one which exists at a higher level than those described by Magnus and de Kleijn. They have described the dissolution of erectness. I have attempted to outline some factors which have contributed to erectness and to explain why its centers exist supramesencephalically.

Dr. Brock has described the disappearance of a righting reflex which has to do with *stereotyped* posture. He has not mentioned the righting reflexes which we all know to exist at very much higher levels, reflexes having to do with destereotyped postures. This much is true; if you take your sons to learn ice skating, as I did a few days ago, you will find that they have a great deal of difficulty in righting themselves. Such righting reflexes are not of stereotyped postures. Their absence does not fit any of the postures one sees in organic disease, and must have centers very much higher than those which Dr. Brock described. I think that the question of neurobiotaxis enters here, too; these centers are cortical; such righting reflexes are truly learned reflexes, not lower, completely unconscious reflexes. This takes us into the sphere of psychiatry and of the postural reflex to emotional changes such as depression and gloominess on one hand, and of elation and triumph on the other.

In closing I wish to compliment both Dr. Wechsler and Dr. Brock on the clear vision which has enabled them to identify the postural defect of parkinsonism with one of reflex righting.

Dr. Smith Ely Jelliffe said: I should say something about what Dr. Kraus said, particularly as to his denial and then leaning upon Jackson's "dissolution" conceptions, but Dr. Kraus's discussion is not under discussion, so I will confine myself to the remarks Dr. Brock made.

It is very pleasing to get this short review of the Magnus-de Kleijn-Rademaker studies. The subject is entirely too complicated for a short presentation. We could spend many days, if not many weeks, discussing it. There are scores of intricate mechanisms, playing backward and forward, and not *a* single mechanism, as Dr. Brock would seem to indicate. The way Dr. Brock speaks of paralysis agitans brings up the question of What does he mean by it? It is not a complicated thing at all from this series of observations. Dr. Brock speaks of it as an "isness" with one mechanism. As a matter of fact, what may be called "paralysis agitans" is a series of syndromes related to involvement of the mesencephalic, diencephalic, and

related structures. In that sense there is no such *thing* as paralysis agitans. It is a mosaic with shifting proportions as the lesions extend to the left or to the right, or further cephalad or caudad. Dr. Brock's summary of Rademaker's paper is quite naïve and I doubt if the author would recognize it. Rademaker's thesis occupies nearly four hundred pages in Dutch, which fortunately has just been translated into German so that we can all read it. That is my contribution. I have enjoyed the evening very much indeed, and I do not intend to derogate the paper in any way. But I do think Dr. Brock has oversimplified an extremely complicated situation.

Dr. Wechsler (closing) said: I am very grateful to Dr. Kraus for his discussion. It is only since I became interested in this subject that I have begun to understand his work. It seems to me that he has given a very excellent contribution to the subject of posture.

The contribution of to-night is an attempt to interpret a clinical observation in terms of physiology. I agree with Dr. Jelliffe that the thing is not so simple, but we are merely trying to apply one physiological fact to a single clinical observation. Of course, paralysis agitans is a disease characterized by a variety of manifestations. The question is, Can we dissociate it into its component parts? We know that hypertonus is not necessarily essential, although it is generally present. What characterizes paralysis agitans is posture or attitude. It is something against which paralysis agitans is always silhouetted. Without going further into the question of tonus, is this posture the result of loss of the *stell-reflex?* This is the central point raised to-night. The man with paralysis agitans cannot quickly resume or assume his normal posture; that is, he cannot right himself. We know, for example, that the *stell-reflex* and the erect posture are influenced by vision; so we tried to find out what happens if you shut the eyes of a patient with paralysis agitans. In a few cases the propulsion was aggravated; in a few others it was elicited when it was absent. The clinical observation of von Sarbo, where if you raise the patient's head and again shut out his vision he falls back, is also in line with our observation. The Souque experiment of putting a patient with paralysis agitans in a chair and suddenly throwing him back, may also point to a loss of the *stell-reflex*. Our contribution, then, deals with the attempt to show that the loss of the righting reflex is the essential of paralysis agitans. We have left out the neck and labyrinthine reflexes, although in another paper we consider their application in various diseases. In connection with the demonstration which Dr. Brock made with the rabbit, I may mention the case of Stenvers. When the patient's pelvis was rotated the head followed every time in the direction of turning. The rabbit, which has its *stell-reflex,* you noticed, kept its head in position even though the pelvis was rotated more than 180°. To state the problem: Is the disturbed posture the essential of paralysis agitans? Is this essentially a disturbance of the *stell-reflex?* And finally, is it the result of a lesion in the region just above the midbrain?

THE RÔLE OF ANXIETY IN THE ECONOMY OF MENTAL LIFE

Dr. Albert Polon (by invitation)

[Author's Abstract]

In this paper anxiety, as a central problem of psychopathology, was dealt with essentially in the light of a psychological approach.

In an attempt to describe and delimit the phenomenon of anxiety it was differentiated on the one hand from the instinctual reactions of fear which is a normal self-preservative mechanism, and on the other hand from morbid fears or phobias which should be regarded as inadequate means of anchoring or overcoming anxiety.

Anxiety was defined as a state of demoralization which is invariably induced when the organism is confronted by an *overwhelming* stimulus. A stimulus proves to be overwhelming when the organism lacks either phylogenetic or ontogenetic equipment to dispose of it in such a manner that the eventual results would be the avoidance of pain or the acquisition of pleasure. In anxiety the pain-pleasure orientation is lost. The consequence is an intolerable state of tension which constitutes a dynamic drive calling for new integrations of the psychic apparatus.

Firstly, the development of the ego from its simplest to its highest forms may be regarded as occurring under the proddings of anxiety.

The moment of greatest helplessness and inability to mobilize adequate responses for survival is obviously at birth. At this low level of the ego its inadequacy must necessarily be compensated for by the love and care available from the environment. The failure to receive this compensation consistently induces states of demoralization or anxiety to which childhood and particularly early childhood is so prone.

In the course of natural events, when the child is compelled to forego the props and assistance it has heretofore received from the persons concerned with its care, it is compelled to evolve a new mechanism which would enable it to get along without the source of external assistance. This mechanism, discovered by Freud, is the mechanism of identification. From now on, the child will behave as if it were one or many persons who played a rôle in its upbringing. The external prop has been shifted inwardly.

It is patent that in this state of identification, the personality of the child represents an aggregate of many incongruous elements devoid of unity or that which we call individuality. The test of experience proves before long that a human being whose behavior is dictated by various identification images which are usually anachronistic, cannot function properly.

He does this or that not because it would further the interests of his personality as a whole, but rather plays into the hands of one or another identification image, which at one time was a source of love and care for him.

Clearly this inadequate conglomeration of incongruous elements must give way to a newer integration, or else anxiety is induced.

The new mechanism is that of ego-ideal formation which comes to the fore when the separate identification images are deprived of their autonomy and are fused, modified, or discarded in the service of evolving the uniqueness of individuality.

In tracing the development of the ego, the following stages have been noted.

1. The inception of the ego which must be dependent upon libido or else anxiety results.

2. When the libido is being withdrawn, the ego compensates itself for the loss of its external sources of libido by way of the identification mechanism again, in order to obviate anxiety.

3. When later on this aggregate of identification images cannot function properly, and hence anxiety results, then, a newer and higher mechanism must be evolved which would bring about a greater integration and uniqueness. In other words, an ego-ideal is formed upon which is conditioned a firm emotional tone of the personality and its greater independence of the outer world. So much for the rôle of anxiety as the push and pressure behind the development of the ego.

The same dynamic rôle of anxiety is found in the evolution of man's love life. From sheer physical gratification which in the man marks the beginning of life there eventually comes about the complex consummation of man's sex energy.

1. By way of a normal love life in the service of procreation and accompanied by psychologic superstructure of love. 2. By sublimation of the sex energy, and 3. By reaction formation.

Where any of these regular mechanisms of ego and libido development cannot assert themselves, anxiety invariably follows. All sorts of psychopathological mechanisms then come to the fore, which mechanisms stand for an arrangement that operated at an earlier level. In other words, since the organism cannot take a step forward, it is compelled to regress. The regression takes place in order to anchor or prevent anxiety. Symptoms, then, as well as normal function, are means of overcoming states of demoralization.

The dynamic mainspring of normal ego and libido development as well as of psychopathologic mechanisms is anxiety.

Discussion: Dr. A. A. Brill said: Dr. Polon's paper is not only very interesting to me, but I consider it perhaps one of the best résumés of Freud's concept of anxiety. Dr. Polon begins with anxiety as presented by Freud as an entity separated from other psychoneurotic disturbances, and goes through its whole evolution as observed in the various forms of anxiety and melancholia and in its identifications as described by Freud in "The Ego and the It." In an earlier work ("Beyond the Pleasure Principle") Freud discusses anxiety following the experiences gained in the World War with so-called shell-shocked cases who manifested various disturbances of anxiety, and formulates his very fascinating ideas about the repetition compulsion and the two impulses, the erotic and the sadistic. This work laid the foundation for "The Ego and the It" in which the ego with its modifications and identifications is fully

developed. However, those who are not conversant with these works may not realize the part that the sexual functions play in anxiety, as Dr. Polon was forced to give mere abstractions of the theories without going into concrete clinical cases. I might mention a case that I recently reported to illustrate some of the identification mechanisms in relation to anxiety. I am referring to a woman who herself was an only child and very narcistic in makeup. She married late in life and had an only child, a boy of thirteen. From what I could gather she lived through her whole narcism in this boy. She was not at all attached to her husband, but centered all her affection in this child. She guarded him at the age of twelve just as she did when he was two or three; she would not let him play in the street, and whenever he went out alone she would always warn him to be particularly careful on crossing the streets. Following his death the mother merged into an agitated state of anxiety which lasted for a number of weeks. Gradually, however, she got over it but retained a mixed neurotic condition characterized by definite phobias and obsessions. I will not go into details of the case, but I will just mention the principal phobia which was an inability to go out alone in the street and particularly to cross streets. Someone had to be with her, otherwise it was impossible for her to go out, or cross a street. In brief, in order to resign herself to this terrible situation of the loss of her son, she identified herself with the lost object and then lived just as she always wished that he live. She acted like the guarded affectionate love object. If you will recall Dr. Polon's paper, you will clearly see the paths followed by the libido in its conversion into anxiety. At first the anxiety floated freely; she was just agitated and anxious, but gradually the anxiety was, so to say, bound up into the phobia. It would seem that Dr. Polon stresses too much the factor of anxiety, that many of the mechanisms that he mentioned in here are in themselves just as important as anxiety, but this I feel is only apparent, inasmuch as Dr. Polon could not give clinical material in the time allotted to him. It is my feeling that in order to understand the problems of the neuroses in all its phases, particularly some of the psychotic conditions such as melancholia, it is absolutely necessary to follow the paths of anxiety from birth until its culmination in pathological symptoms.

Dr. Jelliffe said: If we thought we were dealing with anything complicated in the previous discussion of differences due to structural lesions at varying anatomical levels, we here enter into a field of inquiry where the mechanisms are infinitely more complicated. What pleases me most in the presentation is that Dr. Polon has been valiant about it, and marched right into the center of things, has taken clinical phenomena he has seen, and with all the help of his own ingenuity and with the material from observations of other people working on the same problems, attempts, in a way, to dissect the phenomenon under discussion. I feel quite sure that he entertains no illusions whatever that he has analyzed the entire situation of "angst." As Dr. Polon went forward in his formulations, there were two or three conceptions advanced which arrested my curiosity.

In the first place, I am not quite certain yet as to the suggestion or thought that it is possible by any known process whatever to, as it were, get entirely within the self, and to lose all association with the external world. The external world and self have been inextricably bound up in life ever since life began. Indeed, life depends entirely upon the energy of the environment. To make a schism of the kind suggested would be impossible and have life continue. At the same time it is evident that " panic " must in some degree at least be concerned with this threatening of the *Id* (Das Es).

Secondly, I am not quite satisfied concerning the formulation that the weaning from the mother's womb constitutes the *type* of " panic " production possibility. Things have been born from time immemorial. Babies have been born into the world long before we were born, or our fathers or mothers. They and their forebears came into the world much in the same way as we did, as apparently a new experience, but not so much of a new experience as may seem on the surface. There has been a recapitulation of the new experiences laid down in the pattern, but it is not apparent to me that the individual does have such anxiety with that new birth as might appear from the formula that Dr. Polon has so well given us, in a sense a formula based on Rank's idea of the trauma of birth.

Finally, Dr. Polon's formulation left me a little in doubt as to just where he would group the ego-interest involvements as participants in the panic behavior reaction. If the generally regarded instinct patterns may be said to be made up of ego-interests (self-preservation) and libido (race propagation) it does not seem clear to me that the former activities are sufficiently outlined in the presentation. The deeper one descends into the structure of the *Id,* the nearer one comes to physicochemical forces which bind the organism at those levels more closely identified with ego-interests. Panic seems to me to show some of these in process of partial involvement. Whereas we cannot deny libido even to nitrogen or carbon or to gravity, in the deepest metapsychological sense—indeed, as an aside, I might call attention to Matthews' statement that ultimately chemical reaction behavior will need a psychological formulation, yet, if Dr. Polon is basing his presentation on *psychoanalytic material,* I am as yet unable to allow that such material offers any such insight into chemical behavior, even though I do believe it will ultimately be reached by other methods than those of Pavloff, Cannon, etc. Take the case of angina pectoris and other severe types of cardiac disease. They have been described for us by Cardigan, MacKenzie, and Stokes, and these phenomena are not quite as clearly differentiated as they might be from the type of phenomena of which he speaks. There are states for which, as far as I know he has given us the clinical criteria, which are descriptive of the panicky state, and we should have similar clinical criteria for the type of situation which occurs in cardiac disease. That may plunge Dr. Polon into a very complex problem, but those were the thoughts that were flowing through my mind in a badly arranged form as Dr. Polon was speaking.

Dr. Polon (closing) said: I agree with Dr. Jelliffe that this presentation is suffering from an excess of schematicism, as I understood him to say. However, the justification of this lies in the fact that it is used altogether in the service of furthering lucidity.

It is of course true that no organ, whether somatic or psychic, ever actually functions apart and independent from the rest of the organism. But for didactic reasons one commonly isolates this or that organ for study. This is indeed an artificial procedure. But that is the nature of all scientific analysis. A given whole is regarded as a composite of elements. Most certainly one must not lose sight of the synthetic qualities of an organism under consideration. But to analyze always means to break up a given phenomenon into its parts and deal with each part as if it were a thing unto itself.

As regards anxiety states in such phenomena as angina pectoris and other organic conditions which I did not mention explicitly was nevertheless obviously implied in everything that I said about anxiety. Furthermore, I have indicated that all forms of deprivation, even such as arise within the scope of normal everyday life, are provocative of anxiety, and compel the organism to evolve mechanisms to protect itself.

Apropos of Dr. Brill's reference to an apparent absence of emphasis upon sex as a factor in anxiety, I would like to say that sex was given its due eminent importance in the causation of anxiety. But since it is the ego aspect of the being which receives the brunt of anxiety, I deemed it advisable to deal with anxiety essentially in relation to the Ego. Any more extensive consideration of the rôle of sex in this paper would have made it unsuitable for this sort of a presentation.

PRESENTATION OF RESOLUTIONS REGARDING THE RIGHT OF PHYSICIANS TO TREAT MENTAL CASES IN UNLICENSED INSTITUTIONS

Dr. Bernard Sachs

I wish to talk to you regarding the rights of *patients* to be treated in unlicensed institutions. The part that the physician plays in the matter is really relatively unimportant. The actual incident which led me to the realization of the condition of affairs in the State of New York was this: It happened that at least two patients under my care, or that of my associate, were at a thoroughly excellent private institution in the State of New York. In obedience to the law they had to be removed from this institution where they were being better cared for than in any licensed institution in the State of New York. I know of only one licensed institution outside the state and near New York in which as much care is given to patients as they had at that special place. Occupational therapy, individual care, excellent nurses and food were supplied, and it was just the kind that such patients should receive; the general atmosphere of the place was excellent. I think the Hospital Commission will prob-

ably grant that there were no complaints of this place regarding the care the patients received. I was much astonished by the action taken by the Hospital Commission. I thought the Hospital Commission had enough to do to look after the proper care of the cases in licensed institutions. I did not think it was within the province of that Commission to try to ferret out whether patients were being properly cared for in unlicensed institutions; in other words, in a general nursing home. I wrote to the Attorney General and asked him for an opinion, and I want to bring this matter before you by reading part of his letter to me. Dr. Sachs read this letter from the Attorney General which in general states that the position taken by the State Hospital Commission is justified under the laws of this state.

The Attorney General goes on to state after quoting the provisions, that if the institution has the facilities for the proper treatment of such cases, and is under competent management, as he presumes it must be, there would be no difficulty in securing a license from the State Hospital Commission, and patients could still receive treatment there from individual physicians, subject to the supervision of the physician in charge of the institution.

In a letter which Dr. Haviland wrote one statement was made which Dr. Sachs quoted: "It is obvious that no patient who could properly be committed as insane can be legally treated in an unlicensed private institution." My chief objection to this is that the Hospital Commission has practically the right to state our diagnosis of a neurosis or a psychoneurosis is incorrect and for that reason the patient be taken to a licensed institution. Knowing the progress that has been made in psychiatry, I defy anyone to state the exact moment at which a patient is no longer a neurotic, but is a psychotic, and for that reason must be removed. That is the point which needs distinct amendment. To illustrate this, one of the patients that had to be removed was a young woman, the daughter of a well known professor in this region, who had had a purulent pulmonary process from which she had suffered for a number of years. While she was in that institution, it was necessary to subject her to surgical procedures, and so far as the pulmonary condition goes, that young woman has shown a distinct improvement. In the course of the pulmonary disease, she developed a mild psychosis. The medical inspector made a diagnosis of dementia precox, and therefore she had to be removed. To my mind it was a toxic psychosis, but I am not going to dispute the diagnosis, but the fact is that if one of us has a patient suffering from a toxic process, and in the course of that toxic process the patient develops mental symptoms, and we have considered it wise to put that patient in a properly supervised institution, that the moment that institution happens to be visited by an inspector from the Hospital Commission and the inspector decides the case is one of mental disease, the patient, according to the laws of the State of New York, is taken out of your hands and is put elsewhere. The natural thing that some of us would be inclined to do would be, if one cannot treat such a patient and have him under one's own supervision in the State of New York, to move

him across the border. The laws of Connecticut are much more rational. But one may be accused of spiriting the patient out of the state. I am perfectly well aware of the fact that the Hospital Commission has the duty to see that patients are not illegally detained. Even if there is a real danger there, we should try and amend the law in such a way that that danger can be met, and yet a very large class of patients can be properly treated in small institutions where they can receive much more individual care than they receive in any licensed institution. I do not wish to speak in any derogatory way of the licensed institutions. They have problems of their own. I believe this law should be amended.

Discussion: Dr. Frederick Peterson was unable to be present, but sent the Secretary the following communication:

"In the matter of the discussion of Dr. Sachs' proposition I should like to state my position as briefly as possible.

"I suppose that all that any good physician desires is the safe and proper care of his patient and the patient's early recovery, no matter what the ailment. Insanity, unfortunately enough, has been looked upon too much as a legal offense and not as a disease. So a complicated legal procedure has been built up around the treatment of this particular disorder. Chronicity and paranoid conditions with preserved intelligence have led to certain difficulties in the care of a limited number of patients, owing to the safeguarding of liberty of person, and the needs of legal procedure in a certain small percentage of cases, has led to a form of judicial commitment in *every* case of insanity, including quite often infectious deliria of various kinds. As time has gone on the recognition of insanity as a disease and not a legal offense has gained some ground, so that we see a good deal of latitude allowed now in the treatment of many cases of insanity in general hospitals and psychopathic institutions without the traditional legal formularies, and indeed in many states committed patients are now paroled by the thousands from asylums to their own homes or suitable boarding places. That is, there is a growing tendency to look upon insanity as a disease and not a misdemeanor.

"Things may be much different now but when I was President of the Lunacy Commission for several years, our state hospitals were always much overcrowded and the twenty-five private retreats for the insane under my jurisdiction were of varying degree of character. Some were excellent in every respect, while others were quite dreadful places. I had a law passed to give me an inspector on that account.

"Dr. Russell of Bloomingdale was the first appointee. Really several inspectors were absolutely needed. I believe there are several now. I felt that if we must enforce commitment of these unfortunates to some licensed retreat we as state officials should be able to guarantee good and efficient care in such legalized sanitaria. I suppose at this day eighteen or twenty years later, this good care can be guaranteed in all of the forty or more institutions for the insane in the state. Otherwise it would be a serious matter for state officials to force patients against their own wills and contrary to

the wishes of the family into such legal commitments. At that time I felt that I should not interfere with any mental cases being treated in general hospitals or at a place like the Neurological Institute or at any reputable rest house operated by respectable and trustworthy trained nurses under the care of reputable family physicians or well known specialists. It seemed to me obvious that under such circumstances the best sort of care and treatment were being accorded to patients, and at the time I could not myself guarantee that if committed to some of the licensed places they would have as good and as scientific attention. Of course places were called to my attention where mental cases were being detained and treated without license, and where the personnel in charge and in attendance were without standing in their communities. Such places should naturally be driven out of existence, and this was one of the purposes for which I inaugurated the system of inspectorships. After all perhaps the chief purpose of a hospital commission of a state may be considered to be a safeguarding of the interests of the insane of the state, the guaranteeing of the most ideal and painstaking care of the insane under their actual jurisdiction, and the intelligent unprejudiced consideration of the care of these sick people in general hospitals and unlicensed special hospitals or sanitaria.

"General hospitals throughout the state should be encouraged to open quarters for the reception and study of the supposedly insane pending commitment, so that jails should not be used for detention as is all too frequently the case now in many counties."

Dr. C. Floyd Haviland said: In considering Dr. Sachs' resolution, I am, of course, in accord with him in seeking to promote the interests of the patients concerned. However, in dealing with the problem of mental disease, it is necessary to view it from a broad standpoint, and not from the standpoint of a few isolated cases. The circumstances attending the two cases cited by Dr. Sachs do not represent the usual circumstances attending the care of the average mental patient in this state. The magnitude of the problem of mental disease in the State of New York is one of its most striking features, and it would seem necessary to consider average cases and average situations respecting them in attempting to frame statutory provisions covering the matter. The public and private institutions for the care of mental disease now admit approximately 9,500 cases a year, and in the vast majority of instances no hardships result from present statutes. Such cases as cited by Dr. Sachs in no way represent the average case, even among those admitted to private licensed institutions, for even among them the present law does not appear to result in hardship, nor offer obstacles to prompt treatment.

As a matter of fact, I believe the so-called insanity law of the State of New York renders it possible for patients to receive prompt and early treatment, as do the laws of no other state, and for such reason I believe that the present insanity law of the state is the best in the country. That there is reason for such belief is shown by the fact that other states are constantly using the insanity law of this state as a model in framing similar legislation, and at the

present time the State of California is attempting to revise its entire code of laws referring to the treatment of mental disease, using as a guide the New York statutes.

It must be remembered that all legislation respecting persons suffering from mental disease starts from the legalistic point of view. The lawyer is properly concerned when any person is deprived of liberty against his will, whether by reason of mental disease or for any other reason. Hence, the history of "insanity law" in this country shows that at first the idea of custody was paramount, the statutory provisions being principally concerned with the legal procedure leading to ordinary commitment. However, in this state statutory provisions have been enacted supplementing the ordinary method of legal commitment of the so-called insane, whereby proper cases may readily be admitted to either a public or a licensed private institution for mental disease, with a minimum of legal formality. Treatment is now available for all proper cases without the necessity of commitment.

There is first provision for voluntary admission of patients to any public or private licensed institution upon voluntary application, the only conditions being that the patient shall be in such mental condition as to understand the nature of his act in making application, his condition shall be such that treatment in an institution for mental disease is proper and the applicant is willing to agree to abide by the rules of the hospital and to give ten days' notice in writing before leaving.

The second liberal method is the so-called physician's certificate, whereby a single physician may make a written statement setting forth his reasons for believing that a patient may be properly received for treatment in either a public or private institution for mental disease, whereupon such patient may be received for an indefinite period, so long as the patient does not object and no person objects on his behalf. If objection is raised either by the patient or some person on his behalf, proceedings must, of course, be taken for commitment or the patient be discharged. However, it would seem that the provision mentioned, together with the voluntary form of admission covers much of the objection raised by Dr. Sachs, rendering it possible, as such methods do, for a physician to arrange for the institutional care and treatment of a patient without hindrance or delay, so long as the physician is willing to utilize either a public or a private licensed institution for mental disease for the purpose.

In addition to the methods of admission mentioned, there is also a provision whereby a health officer may execute a certificate which is valid for a period of thirty days, during which a patient may be kept in a hospital pending commitment. There is also statutory provision for the so-called ten days' emergency admission, which means simply that a patient may be admitted to a proper hospital on the usual medical certificate only, which remains valid for a ten-day period, during which time the usual order of commitment may be obtained. It thus would seem that so far as statutory provisions are concerned, mental patients in this state need not be deprived of

prompt institutional care and treatment through any defect of law.

As to the specific point raised by Dr. Sachs respecting unlicensed private institutions to supplement the present private licensed hospitals, I would say that even now mild mental patients may be cared for in unlicensed institutions. The State Hospital Commission has never ruled that the presence of mental disease as such necessarily means treatment in a licensed institution. The Commission has, as it believes, liberally ruled that only such mental patients as may fairly be deemed to be committable are of necessity treated only in licensed sanitaria. A case comes to my mind of a definitely deteriorated precox, who, however, is quiet and manifests no offensive conduct disorders, so in the judgment of the Commission the necessity for the patient's commitment may be regarded as open to question, and hence no objection has been raised to the patient's treatment in an unlicensed institution. However, when the propriety of commitment is clearly indicated, the State Hospital Commission is definitely of the opinion that the patient should receive institutional care only in a private licensed institution or a public institution under the jurisdiction of the Commission, that there may be no question but that such a patient who is legally deprived of liberty is placed only in an institution where proper standards are maintained.

So far as I am aware, there is no difficulty in securing admission of patients to private institutions, as a considerable number of them are rarely filled to capacity. As regards the desirability of placing patients in small institutions of limited capacity, would say that there are licensed sanitaria in this state of but two or three bed capacity, they ranging in capacity from such number up to 150 beds or more.

Essentially the licensing system means a method whereby the maintenance of standards can be assured. If the state through process of law subjects a mental patient to institutional treatment, it seems obvious that it is the duty of the state to adopt means to render certain the maintenance of proper standards. Such means would, of course, be lacking, were unlicensed private institutions permitted to receive patients in such mental condition as to warrant commitment.

I would readily admit that the institution mentioned by Dr. Sachs maintains standards equal to those maintained by the licensed institutions, and such a sanitarium would have no difficulty whatever in securing a license. However, unlicensed institutions maintaining such standards are rare, and I venture to assert that for every such unlicensed institution as described by Dr. Sachs, there are at least a dozen unlicensed institutions maintaining much lower standards, in which mental patients could not be expected to receive proper care and treatment.

Apparently the main reason why the sanitarium mentioned by Dr. Sachs has not sought to be licensed is because of the necessity of having a resident physician. However, the State Hospital Commission feels that there should be a resident physician in every institution dealing with such extreme cases of mental disease as to warrant commitment, that there may be a physician on call to meet emergency

situations, which as we all know, are apt to occur at any period during the twenty-four hours.

The past experience of the State Hospital Commission indicates that just as soon as vigilance is relaxed, unlicensed institutions for mental disease are established on a commercial basis, with scant heed to patients' interests and an utter failure to maintain proper standards of treatment. A case in point is that of a chiropractor, who was found some time ago caring for several cases of dementia precox in a private house on the west side of New York under the most deplorable conditions. There was no medical attendant, and the only caretaker of the patients was an ignorant foreign woman devoid of experience in caring for mental disease. The patients themselves were found in a state of bodily uncleanliness, torn clothing, and generally unkempt condition. Their relatives had been willing to consign them to the chiropractor's care, merely because of the low cost, his charge, of course, being below that of a regular licensed institution. There is scarcely a month that the State Hospital Commission does not receive complaint regarding some unlicensed institution caring for mental patients, and investigation shows that perhaps half of the institutions brought to the Commission's attention are illegally caring for patients under improper conditions. If unlicensed institutions are to be authorized by law to care for mental patients, there will then, of course, be no way whereby the state can force the removal of patients from the improper conditions found in the vast majority of such institutions.

There is undeniably a tendency, particularly in the legal profession, to seek greater legal restrictions respecting the institutional care of mental patients. There has, for instance, been a bill introduced into the Legislature for the past several years providing for a jury trial as a prerequisite for commitment. Even last year the bill was defeated only after considerable effort. There thus appears to be a great danger of an adverse reaction whereby treatment of mental patients will be rendered more difficult if we go too far in removing the state's control of the situation. That such control should be exercised through the continuance of the licensing system for private institutions for mental disease is, I believe, clearly indicated by past experience. If such control should be removed, I am confident that it would be prejudicial to the interests of the vast majority of the patients concerned.

By invitation, the following excerpt from a letter from Dr. Carlos F. MacDonald was read:

"Respecting the Resolution in question, I feel compelled to say that its adoption by the Neurological Society would, in my opinion, be most unfortunate. This opinion is based on my somewhat large experience in dealing with private institutions for the insane during the seven years of my services as President of the State Commission in Lunacy, now the State Hospital Commission. When this Commission, in the first year of its existence, 1889, began an investigation of the private institutions for the insane in the State of New York, it was found that there were a considerable number of them

which were unlicensed and receiving many manifestly insane persons whose condition was such as to require that they be placed under legal control and supervision—in other words, by commitment to licensed institutions for the insane. These unlicensed institutions, of which there were several, were none of them conducted by persons who were qualified, either by experience or otherwise, to conduct such institutions, the proprietors of several of them being nonmedical persons, both men and women.

"It is hardly necessary to say that we found many instances of the grossest abuse in the conduct of these institutions, not to mention instances of illtreatment, and neglect of the inmates; and there were also, among the licensed institutions, several of which having received licenses from a former administration, the proprietors of which were grossly incompetent to conduct such institutions.

"The Commission, therefore, after due consideration, proceeded, under statutory provision, to revoke the licenses of all private institutions for the insane, and to issue new licenses to those who were considered worthy. We also issued a general order, requiring that all licensed institutions be conducted by a Physician in Charge, who had had at least five years' experience in the care and treatment of the insane in an institution for the insane, together with certain qualifications as to professional and moral standing.

"It is my opinion, therefore, that the adoption of the proposed resolution would be equivalent to a return to the old county care system of institutions for the insane, and would mark a decidedly backward step.

"Moreover, it is morally certain that, if physicians were permitted to place mental cases in unlicensed institutions, that all sorts and kinds of abuses would creep in.

"For the reasons stated above, I am unqualifiedly opposed to the adoption of such a resolution."

Dr. Thomas William Salmon, by invitation, said: It seems to me that this is a very difficult question, and not one to be settled offhand, and that the Society might easily put itself on record in favor of a change in the law which does not work for the benefit of the patient. The most practical way is for the Society to appoint a small committee to coöperate with the New York Society for Clinical Psychiatry and the State Hospital Commission, to bring about such amendments in the statutes as may be thought necessary.

Dr. William L. Russell, by invitation, said: I will not say more than a few words. I think it should be clearly understood that the State Hospital Commission has a very wide latitude in making regulations in regard to institutions. The law does not designate all the requirements that are laid down, such as the qualifications of the physician in charge, and it seems to me it would be very much wiser to take the problem up with the Commission and see what can be done about the regulation of licenses. I think any attempt to break down the license system would be unfortunate, and could not be carried through. Every country has some safeguard for people suffering from mental disease. If brought before the Legislature, not

only the legal aspect, but popular prejudice will come to the front. We should realize what progress has been made. Instead of all being committed, as was the case when the license system was introduced, a very large proportion of the patients are now admitted on voluntary application. It would not be possible to have a system in which voluntary patients were being taken care of in licensed institutions, and the same class of patients in unlicensed institutions. It seems to me that the wisest plan would be to have a committee appointed for a conference with the State Hospital Commission, to consider if the purposes which Dr. Sachs has in mind, in which we all sympathize in a measure, cannot be accomplished without appeal to the Legislature. The time is ripe for a revision of the license system in view of the great change that has taken place in the psychiatric situation.

The Chair appointed a committee consisting of Drs. Kirby, Peterson, and Sachs to confer with committees from other societies to consider the question further and to make a report to the Society.

Current Literature

II. SENSORI-MOTOR NEUROLOGY.

3. SPINAL CORD.

Petrén, K. Diagnosis and Treatment of Spinal Cord Tumors. [Am. Arch. Neur. & Psy., 14, 1925, No. 1.]

The author has in the first place treated the question of diagnosis of spinal tumors. It seems that the idea is generally accepted that the cellular condition of the cerebrospinal liquid should be normal with spinal tumors. The author has come to some other result. In eight cases of tumor of the meninges he has found that three between them had from five to seven cells and two had three cells. The diagnosis was in these cases confirmed in vivo or at post-mortem. In five cases in which the diagnosis of tumor from the meninges seemed to be certain (but not confirmed by necropsy), one had from four to five cells, one from seven to eight cells, and one from thirteen to twenty-three cells. In the last cases, however, there were also tumor cells in the spinal fluid. We find, then, that in about one-half of the cases of tumors of the meninges, there have been an increased number of cells. The author accepts the standpoint that three cells should be the highest that can be observed and be considered normal. But from the other point of view he is uncertain if three may not perhaps be regarded as too high.

Further Petrén speaks of his experiences with roentgen-ray treatment of cases of tumors of the meninges. Many authors have before spoken of the good results obtained in syringomyelia. But almost none has observed any results in spinal tumors (exception only for Gamegun, Saenger, Geehardt). In one of the three cases that the author has reported good symptomatological effect on the symptoms one can discuss if it should be the question of syringomyelia or of circumscribed glioma in the spinal cord. In one of the cases it was metastasis after a myxosarcoma that has been extirpated. The effect was very striking for about one year but later the patient died from generalized metastasis with ulcerations and sepsis. In the third case there was evidently an intramedullary tumor. The patient has first been operated but at the laminectomy no tumor was found in the meninges but the spinal cord seemed to be thickened and somewhat discolored. The patient has afterwards roentgen treatment and first after this regained the faculty to walk. That has continued at least for some years (before she has had a paralysis of the lower extremities).

This experience lets us know that in some forms of spinal tumor it can happen that X-ray treatment has a very favorable influence on the function of the spinal cord. Certainly, the author states he has not at all solved this problem, but only has been able to call attention to the possibility that such favorable effect can be obtained in some cases. Especially the question is not at all solved as to what forms of tumor and under what conditions this treatment could be indicated. Petrén is quite of the opinion that where the operation cannot remove the tumor this way is to be chosen. [Author's abstract.]

6. ENCEPHALITIS.

Foster. Ocular Symptoms of Epidemic Encephalitis. [Amer. Journ. Ophthalmol., Jan., 1922.]

The ocular symptoms in two cases of epidemic encephalitis are here discussed in detail and the author urges the desirability of carefully reporting such observations in order that, by clinical grouping of the symptoms in individual cases, greater assistance may be given to early diagnosis. In the first, a man aged forty-six, there was partial loss of function of the left abducens and, to a less degree, of the left levator palpebræ, with total loss of function, sudden in onset, of both inferior recti. The following day the patient slept almost continuously, and the paresis of the ocular muscles became more marked, the left eye having almost no movement except inward, while in the right eye the externus was the only muscle which seemed to function normally. The pupils were small and reacted quickly to light but not to accommodation. After five days of lethargy recovery slowly began, and three days later the ptosis had almost disappeared, and the other extrinsic muscles, with the exception of the left externus, had regained their functions. In the second case, a man aged forty-four, the striking feature was the very fleeting nature of all the ocular symptoms. Commencing with ptosis of the left upper lid and paresis of the left superior and inferior recti, and followed by complete paralysis of the left internus, at the end of six days the ptosis was less and all the ocular paralysis had disappeared. After an uninterrupted convalescence the patient was discharged apparently well, but later developed fits of drowsiness preceded by ptosis, partial or total, until he sank into complete lethargy with the eyes fixed straight forward, and the left cornea was much more sensitive than the right. The pupils in the first attack reacted both to light and to accommodation, but there was little reaction to light later.

Ebaugh, Franklin G. Neuropsychiatric Sequelæ of Acute Epidemic Encephalitis in School Children. [Am. J. Dis. Child., Feb., 1923.]

In the article "Neuropsychiatric Sequelæ of Acute Epidemic Encephalitis in Children" seventeen cases of post-encephalitis are reported

and analyzed from the neuropsychiatric viewpoint. The psychiatric sequelæ consisted of: (1) Total change in character and disposition with characteristic hyperkinetic states, leading to behavior oddities on the basis of emotional lability, sexual precocity, general incorrigibility, etc.; (2) agitated nocturnal insomnia; (3) affective disorder of depressive type; (4) hysterical reaction; (5) tics, fears; (6) mental deficiency.

The neurological sequelæ consisted of headaches, dizziness, diplopia, drowsiness, asthenia and oversalivation. Disturbances in motility, especially choreiform movements were present. These disturbances appeared to be related to the mental state since they were increased by emotional experiences. Visual disturbances and facial weakness also occurred as residuals. One case showed endocrine changes. An offer suggests that the prognosis should be guarded, but pessimism should be avoided. Fifty per cent of these cases are well or improving. The advisability of sending children to the psychopathic wards for observation is mentioned. Also the effect of spinal drainage, which was effectual in several cases. These children did not react to discipline. [Author's abstract.]

Thalhimer, W., and Updegraff, H. Sugar Content of Blood and Spinal Fluid in Epidemic Encephalitis. [Am. Arch. of Neur. and Psych., Vol. VIII, No. 1, p. 15. J. A. M. A.]

Thalhimer and Updegraff found that in epidemic encephalitis the sugar content of the blood and spinal fluid is increased, but only after a certain level of blood sugar has been reached. At present hyperglycorrhachia can be used chiefly to differentiate epidemic encephalitis from the two conditions with which it is most likely to be confused—tuberculous meningitis and early poliomyelitis.

Bouman, L. Diffuse Periaxial Encephalitis. [Neder. Tijd. voor Genees., LXVI, p. 639.]

Bouman reports a case of diffuse periaxial encephalitis in a married woman of thirty-two. Soon after a confinement she began to have vertigo with tendency to fall, myoclonic shocks in head and body, inability to judge distances, tinnitus, severe headaches, often nausea without vomiting, normal mentality, slight albuminuria, but no casts, left hemianopia, and slight double optic neuritis. Two months later an attack, cried out, head and eyes to right, pulse 36; after attack was for some hours confused and sleepy. Lumbar puncture showed a pressure of more than 65 cm. Soon afterwards she was trephined, the diagnosis being tumor or cyst of the right occipital lobe. But nothing was found and puncture proved negative. Then the visual field and hearing power diminished and gradual psychical deterioration set in; she was disoriented, failed to recognize surroundings, showed perseveration of commanded movements; had violent frontal pains with screaming in the attacks. Then paresis of both legs and right arm, pain in right arm, a large bedsore, and cystitis. She became somnolent and recognized nobody. Four months

later (eight after onset) death. Brain only examined. Necropsy showed a peculiar greyish-yellow change in the medullary substance of the cerebral hemisphere, greatest in the occipital lobes, but also in the parietal and temporal lobe. The right ventricle was so greatly dilated toward the occipital pole that the occipital lobe in its hindmost part appeared as a thin walled cyst whose inner wall passed over without any limit into the ventricular wall. Microscopical sections of the medullary substance of the occipital lobes at the site of the cyst of the corpus callosum showed a peculiar appearance. The great number of glia cells suggested at first a gliomatous infiltration. But closer study showed that the case was one of Schilder's diffuse periaxial encephalitis. The perivascular infiltration was composed almost entirely of lymphocytes, among which were a few granule cells, but no plasma cells nor leucocytes. Many endothelial cells of infiltrated vessels had swollen nuclei; cortex and pia were free from infiltration. The connective tissue proliferation extended far from the perivascular tissue into the brain parenchyma The glia changes were of many kinds, especially in the abnormal areas there were diffusely spread glia cells with large, often irregularly, contoured nuclei. Also many irregularly contoured glia nuclei that appeared in little heaps with a radial structure and monster glia cells shaped like pollard willows. In the affected areas there was loss of almost all the medullary sheaths and the few remaining ones were very irregularly swollen up; and there was extraordinarily great up-heaping of fat in these areas of medullary sheath loss. In the brain stem there was no secondary degeneration, but in medullary sheath preparations there were numerous small, sharply circumscribed spots without any medullary sheaths, which were just like small beginning foci of multiple sclerosis. [Leonard J. Kidd, London, England.]

7. TESTS, REFLEXES, SYMPTOMS.

Forbes, A., Ray, L. H., and Griffith, F. R., Jr. The Nature of the Delay in the Response to the Second of Two Stimuli in Nerve and in the Nerve-Muscle Preparation. [Am. Jl. of Physiology, November, 1923.]

Lucas (1) observed that when a muscle is stimulated directly or through its motor nerve, a second stimulus applied soon after the end of what he termed the refractory period evoked an electric response with a longer latency than that of the first response. Gotch had previously reported a similar observation in the electric response of nerve to two stimuli. Lucas examined the correlation of the time of second response with the time of second stimulus in his own observations and in those of Gotch, and concluded that the extra delay of the second response was in each case caused by a modification of the tissue resulting from the previous propagated disturbance. He objected theoretically to the ex-

planation which Gotch proposed,—that conduction was retarded during the recovery from a previous response; but he left unexplained the mechanism of the additional delay. Lucas and Bramwell had previously proved that the refractory period is an inseparable consequence of the propagated disturbance, and is not associated with the purely local effect of the stimulating current. Lucas implied that the delayed appearance of the response to an early second stimulus must be due to some other modification of the tissue; that is, that it could not be explained as simply due to the refractory phase. With both amphibian and mammalian nerves and nerve-muscle preparations we have repeated some of the experiments of both Gotch and Lucas, and have supplemented them with others. With a string galvanometer we have explored the nerve-muscle preparation, recording the responses to two stimuli of various strengths and at various intervals. We have recorded the responses of the nerve at various distances from the point of stimulation at various temperatures. We have recorded also the responses of the muscle to stimulation through the nerve.

With nerves we find that if the second stimulus is made sufficiently strong the refractory phase, in the old sense meaning the time at which the second stimulus may be applied without evoking a response, can be reduced to nothing. It is well established that the propagated disturbance is set up by a local excitatory process which in turn is the direct result of the stimulating electric current. The local excitatory process resulting from a stimulus too weak to excite, has been shown to outlast the electric current. No stimulus is absolutely instantaneous. A break shock from an ordinary coil with an iron core may have sufficient duration and strength to evoke a second response in nerve without any second stimulus. There is, however, a definite time after a response during which the nerve cannot respond again. The second response does not appear till the end of this time, whether evoked by a second stimulus or by virtue of the strength and duration of the first. We propose to call this time the refractory phase. We have confirmed Bazett's observation that the strength of the first stimulus does not affect the recovery curve of the threshold, provided it be maximal in every case (i.e., adequate for all fibers). From this we infer that when the local excitatory process has initiated a propagated disturbance it ceases to exist. By using a strong second stimulus we have shown that the interval between responses in the nerve is correlated with the interval between stimuli in a manner which Lucas found only in the case of a muscle excited through its nerve; namely, one in which as the stimulus interval is made progressively shorter there develops a gradually increasing delay in the appearance of the second response, this delay becoming so great with the briefest stimulus-intervals that the response-interval, after passing through a minimum, actually becomes longer again. This type of correlation is most easily explained by the fact that an early second stimulus applied

when the nerve is refractory can set up a local excitatory process which may persist till the nerve is sufficiently recovered to respond again, and by the fact that the threshold recovers gradually during the relative refractory phase. This explanation is supported by the observation that at a given stimulus-interval a large increase in the strength of the second stimulus hastens the second response.

Using long nerves from the cat and the bullfrog, we have shown that a second impulse set up in the relative refractory period travels slightly more slowly than the first. This observation has been corroborated by more accurate measurements of Gasser and Erlanger with the Braun tube. The speed approaches normal gradually as the interval is increased, and becomes normal at about the same interval at which the size of the second response becomes normal. This slowing of conduction can be simply explained, on the membrane theory of the nerve impulse, in terms of known features of the relative refractory phase. This theory holds that the nerve impulse consists in the progressive breaking down of a difference of potential across the membrane, and that its conduction depends on the stimulation by the resulting electrical disturbance (action current) of the next section of the fiber. It is well established that, during the recovery process or relative refractory period following an impulse, the size of the electric response and the excitability of a nerve are both subnormal. This would account for the observed slowing of conduction, which thus tends to support the membrane theory. In recording the response of muscle to stimulation through its nerve we find that in addition to the delay in initiating the second nerve impulse and the slight lag due to its slower conduction there is a distinct delay in the setting up of the second muscle response by the second nerve impulse. This is most simply explained as the result of the refractory phase of the muscle, which prevents it from responding sooner. This demands the postulate that the nerve impulse has the power to excite the muscle for a time after its moment of arrival at the neuro-muscular junction, either by virtue of its own duration, or through some special activity to which it gives rise at the junction. This last conclusion is reinforced by records showing a still greater delay in the response of the muscle to a third nerve impulse. The time when the third muscle response appears is most simply explained as depending on the muscle's refractory period. This latter appears to be briefer after a subnormal response than after one of normal magnitude. In general, in the case of excitation and conduction in nerve, and in the case of transmission from nerve to muscle, there seems to be no need of assuming any modification of a tissue, resulting from the passage of a propagated disturbance, other than the refractory phase. With certain nerve-muscle preparations at certain temperatures it is possible to evoke four successive muscle responses to four nerve impulses in such rapid succession that each muscle response shows a greater delay than its predecessor. By this means it is shown that the muscle can start

to respond to a nerve impulse at any time after its arrival during an interval approximately equal to the duration of the action current of the nerve. This supports the view that the action current of the nerve is the stimulus for the muscle. In this connection the possibility of explaining Wedensky "inhibition" and summation of propagated disturbances on Lapicque's theory of direct excitation of muscle by nerve (without the intervention of a special junctional tissue) is discussed. Lucas (2) showed that Wedensky "inhibition" depends on stimulating the nerve with such frequency that each impulse falls in the relative refractory phase following its predecessor, and is therefore subnormal. The failure of the muscle to contract may be due to a block at the junction through which the subnormal impulses cannot pass, as Lucas suggested, or conceivably to a lowered excitability of the muscle fibers such that the subnormal nerve impulses are no longer adequate stimuli. The question is left unanswered. The bearing of these observations on certain reflex activities and on voluntary contraction is considered. It is shown that the refractory phase of muscle may possibly explain certain observations of Adrian and Olmsted (3) on double reflex responses which have been taken to signify a refractory phase of about 0.006 sec. in the reflex arc of the flexion reflex in the cat. The possibility must not be overlooked that an early second motor nerve impulse, being subnormal, may have failed to excite the muscle whose excitability was still subnormal after its first response. The bearing of this on the frequency of motor-nerve impulses involved in sustained voluntary contractions is discussed. It is concluded that this frequency probably lies normally between 300 and 600 per second.

References:

1. Lucas: Journ. Physiol., 1909, XXXIX, 331.
Lucas: Journ. Physiol., 1910, XLI, 368.
2. Lucas: Journ. Physiol., 1911, XLIII, 46.
3. Adrian and Olmsted: Journ. Physiol., 1922, LVI, 426. [Author's abstract.]

8. NEUROSYPHILIS.

Villaverde. Hallucinosis in Syphilitics. [Arch. d. Neurobiol., September, 1920, I, No. 3.]

This is a clinical paper in which is reported the histories of three patients in whom hallucinations developed three months and a half, ten months, and two years, respectively, following the initial chancre. They accompanied periods of excitement and delirium. Auditory hallucinations were more common than visual ones, and ideas of persecution were also present. The attacks lasted several days and recurred, but under vigorous specific treatment ceased. The blood and spinal fluid responded normally after recovery in all three cases. One young man developed a schizo-

phrenic syndrome a year later. A complete catatonic picture developed a year or two after infection with syphilis in three patients under observation. One of the patients had had repeated attacks since the age of fifteen, and did not contract syphilis till twenty. The literature is reviewed. Plaut's work on the syphilitic psychoses (see Diseases of Nervous System, Jelliffe and White, 4th Ed.) being considered a classical exposé of this type of syndromy.

Ravaut, Arbeit and Rabeau. TREATMENT OF NEUROSYPHILIS. [Paris Médical, X, No. 46.]

In this clinical therapeutic paper the excellent results obtained from the employment of a hypertonic solution of neoarsphenamin mixed with the patient's own spinal fluid is reported. Four to six mg. of the arsenical preparation is given. The benefit derived in meningo-myelitis, tabes, and general paresis is discussed on the basis of eight patients. The moment for the injections is judged from the biologic reactions in the spinal fluid.

Solomon and Klauder. PROVOCATIVE REACTIONS IN C.S.F. IN NEUROSYPHILIS. [Arch. Derm. & Syph., December, 1920.]

This clinical paper shows that after treatment by arsphenamin the cerebrospinal fluid, which was negative before treatment, may become positive, or a weakly reacting fluid may become stronger. This "provocative reaction" may be evoked by intravenous or intraspinal injection of arsphenamin; it is comparable to the provocation of the W. reaction in the blood and to the Herxheimer reaction (production of neuro-recidivis). The provocative reaction is shown to occur in both the ventricular and spinal fluids. It is not a frequent phenomenon, and patients with vascular neurosyphilis with negative cerebrospinal fluids may not react in this manner; by the reactions, however, diagnosis may occasionally be made clear in obscure cases. In none of the cases in this series was the provocative reaction obtained with the blood serum. Despite the increase in the strength of the spinal fluid reactions, clinical improvement may result, and continued treatment may again produce a negative fluid.

Scott, G. O., and Pearson, G. H. J. NEUROSYPHILIS. [Am. Jour. of Syphilis, April, 1920.]

This is an analytical clinical paper in which the authors review the case histories of some 210 cases. Among other things they maintain that intraspinal injections are of use in the treatment of neurosyphilis as well as being an aid to diagnosis. Small doses of arsphenamized serum introduced into the spinal canal sets up a Herkheimer reaction or its analog, if syphilitic infection is present. If a case be suspected clinically to be neurosyphilis, though serologically negative, a small dose of arsphenamized serum may render the fluid positive and thus clear up the diagnosis.

Tezner. THE CEREBROSPINAL FLUID IN CONGENITAL SYPHILIS. [Monatsschr. f. Kinderheilk., October, 1921.]

In contrast with the numerous investigations of the kind in acquired syphilis, comparatively little has been written about the cerebrospinal fluid in the congenital disease, while the results obtained by various observers are conflicting. His own researches included the study of four reactions, namely, the Wassermann reaction in the blood, the Wassermann reaction in the cerebrospinal fluid, cerebrospinal lymphocytosis, and the Nonne-Appelt reaction, which were carried out in forty-three cases. In a few cases Pandy's reaction was also performed. It was a remarkable fact that whereas lumbar puncture in adults not infrequently causes symptoms of meningeal irritation, in spite of confinement to bed for two days, the only symptoms observed by Tezner in the course of sixty-two lumbar punctures were temporary apnoea in an infant and headache and vomiting in an older child. The results of the examination of the cerebrospinal fluid were as follows: All the reactions were positive in 41.8 per cent, the Wassermann reaction was positive alone in 32.5 per cent, and lymphocytosis, together with a postive Wassermann reaction, was found in 13.9 per cent; sixteen of the total number were infants, among whom all the reactions were positive in 62.5 per cent, the Wassermann reaction was positive in 50 per cent, and a positive Nonne reaction and lymphocytosis were found in 31.3 per cent. With one exception, in which the spinal fluid showed lymphocytosis and a positive Wassermann reaction, all the infants showed a well marked syphilitic eruption; twenty were older children without nervous symptoms, in whom all the reactions were positive in 15 per cent, and a positive Nonne reaction and lymphocytosis were found in 5 per cent; seven were elder children with nervous symptoms, in whom the Wassermann reaction was positive in 70.1 per cent, and lymphocytosis was found in 20 per cent. Pandy's reaction, in the few cases in which it was performed, corresponded to Nonne's reaction, but the other reactions did not show a similar parallelism. These results indicate that a positive Wassermann reaction in the cerebrospinal fluid in congenital syphilis is much more frequent than in adults, and is indeed often the only change present in the fluid. On the other hand, although the fluid was affected in a comparatively large number of cases, the changes rapidly disappeared and did not represent a permanent damage to the central nervous system. [B. M. J.]

Sargent, J. C. WASSERMANN CONTROL. [Am. Jour. of Syphilis, April, 1920.]

This clinical paper analyzes somewhat optimistically the results obtained in the study of twelve cases of inherited syphilis treated by both arsphenamin and mercury. The conclusion is reached that it is worth treating such. These few cases show that they react to treatment in about the same way as do adults with acquired syphilis. The Wassermann C.S.F. reaction offers an excellent control in the treatment, but should be

appraised in conjunction with the physical findings and the past history of the patient. Primary syphilis with positive W. cannot be cured by a few injections of arsphenamin or a few months' treatment with mercury. Treated intensively and over a long period, an excellent prognosis, however, may be assured. Many cases of secondary and tertiary syphilis, when treated intensively with arsenic and mercury for one to three years, can be rendered Wassermann negative and apparently cured.

Kerr, D. Juvenile Tabes. [Lancet, March 13, 1920.]

In this clinical paper the author reports the history of a fourteen-year-old patient with the following syndromy: lightning pains, optic atrophy, lost knee jerks. The hereditary history was negative and the blood and C.S.F. negative serologically.

Sezary, A. Pathogenesis of Tabes and Paresis. [Revue Neurologique, April, 1921.]

This pathological discussion advances what the author would consider a new point of view concerning the pathogenesis of tabes and paresis. The lesions of the nervous system in these diseases, he argues, are comparable to those provoked by syphilis in a nonimmune body. In nervous tissues the action of syphilitic antibodies is annihilated. This is in accordance with facts of general pathology, and they suggest to Sezary that the central nervous system constitutes a tissue complex which has different immunological reactions. Thus, in the case of animals already immunized against tetanus and other toxins, if further toxin be taken and injected into the brain a positive instead of the expected negative reaction will occur. The conclusion is that the nervous system, by reason of its chemical constitution or the possession of some reducing power, does not feel the effect of immunizing substances introduced in ordinary ways. The hypothesis applied to tabes and paresis is that nervous tissues primarily have a certain natural immunity against *Treponema pallida.* This immunity, however, does not afford complete protection. It retards the development of the noxious organism, but after the secondary stage of syphilis the nervous system does not share that immunity which the rest of the organism has acquired. The *Treponema* which has previously invaded it adapts itself, grows, and finally determines atypical lesions because they escape the humoral factors which govern classical syphilitic processes. Sezary's hypothesis takes into consideration the differences between vascular and parenchymatous syphilitic changes in the nervous system. and explains, he holds, the reasons for the therapeutic resistances in tabes and paresis.

Ferrand, W. Specific Treatment of Tabes. [Bull. Méd., XXXIV, No. 51.]

This discussion dwells particularly upon the chronic meningovascularitis which is present in tabes, and concerning which French neuro-

psychiatry has had much to say. This meningeal reaction accompanies every case of tabes, and is responsible for a large number of the nontabetic nervous symptoms in the clinical picture. Treatment should be vigorous and immediate in order to stay the evolution of this meningeal syphilosis. In favorable cases it may be possible to cure it before extensive and definite lesions of degenerative sclerosis have developed. Its progress can be retarded. Biologic and clinical signs of the incipient phase can detect the onset, and by massive therapy may ward off further consequences. With established tabes, specific treatment may mitigate many of the symptoms and arrest further progress.

Lafora, G. R. Pathogenesis of Tabetic Ataxia. [Archives de Neurobiologiá, I, No. 4.]

This Spanish neuropsychiater calls attention to the neurological substratum of this interesting symptom. Ataxia, he says, may be intense even if the sensory disturbances are slight, or the contrary may be seen. Hence the parallelism heretofore taught must be modified. In a congenital tabetic described, the ataxia had developed rapidly, but no analgesia of joints or periosteum were obtained. The ataxia subsided after a second intraspinal injection, and also the girdle pains. Two cases of acute and intense ataxia in men thirty-four and forty-two years of age, respectively, showed intact sensibility. Improvement was promptly obtained with intraspinal treatment. In two other cases in men of the same age the periosteum sensibility was lost, but the articular sensibility was intact in one; in the other the tendon reflexes were abolished. No ataxia was present. Other factors besides the purely sensory are involved in the pathogenesis of tabetic ataxia and Lafora suggests that a search be made in the upper neuron chain for a more satisfactory explanation of this symptom. [Maloney has already done this, showing the psychogenic element of fear and also of unconscious parasitism.—Ed.]

Buzzard, E. Farquhar. Early Recognition and Treatment of Tabes. [Proceedings of the Royal Society of Medicine, December, 1920.]

In this clinical paper the author calls attention to the acknowledged fact that, in a large proportion of unmistakable cases of tabes, a history, often extending over five, ten, or more years, of pains which have been regarded as neuritic or rheumatic in origin and have not been associated with any other disability, can be elicited. Such pains often are the earliest signs of tabes, and careful inquiry can differentiate them from pains of other origin. They are like the stab of a knife or a darning-needle, or they resemble the effect produced by taking up the flesh, pulling it, and letting it go again. They are rapidly repeated and paroxysmal. The heel, the inner aspect of the shin and knee are frequent sites. The area usually is small. These areas are often tender to light touch in the intervals. The tabetic suffers from other pains, deep, gnawing and aching, and other subjective phenomena, but these are not

pathognomonic. The honest advice medical men can give to patients suffering from any syphilitic disease is that they should continue to have periodic courses of treatment for the rest of their lives. "After many years of critical study of this problem, I am convinced that the lightning pains of tabes are, for practical purposes, pathognomonic, and that they can and should be recognized before they are many months old. Treatment initiated before physical signs are apparent is likely to be attended by good results if persevered with." This is his general résumé.

Piccinino, F. Electropuncture of the Spine in Tabes. [Réforma Medica, XXXVI, No. 1; J. A. M. A.]

Piccinino has found vigorous revulsion applied to the spine effectual in treatment of tabes, often curing the ataxia (psychogenic?) or other disturbances. He prefers for the purpose a needle connected with the negative pole. This induces an electrolytic action deep in the tissues, but strictly localized. The positive electrode is placed on the spine above or below, with continuous current from pile or battery, connected with street lighting current, with galvanometer and rheostat. In cases rebellious to coures of mercury, this electropuncture at the points most diseased seems to attract the drug to these points, and clinical improvement results. The negative pole branches and this can be connected with two needles; one is inserted to a depth of 1, 2 or more cm. and a current of 10 or 15 milliamperes is turned on. The electrolysis causes bubbles of gas around the needle; when this occurs, the second needle is introduced and the first withdrawn. This avoids sudden shocks, and in this way from 50 to 100 punctures can be made at a single ten or fifteen minute sitting, under a local anesthetic and epinephrin. This method of intrapolar catalysis, he says, is applicable to any form of meningomyelitis, especially those with spastic phenomena.

Vasconcelos, A. Brioso. Treatment of Neurosyphilis. [Gaceta Médica de México, January, 1920.]

Seven cases from his own practice are here reported in which intraspinal treatment was employed. Direct treatment of neurosyphilis is advocated whenever the spinal fluid gives a positive W., Pandy, Lange, Nonne, or Noguchi reaction. When several of these reactions are associated the treatment should be vigorous.

Hahn, F. Silver Arsphenamin in Syphilis. [Deut. med. Woch., 1920; J. A. M. A.]

Hahn has been using silver arsphenamin for two years and now reports the results, after treating 300 syphilitics and giving nearly 4,000 intravenous injections. He endeavors to justify his standpoint that syphilis early diagnosed should be treated energetically and with large doses of arsphenamin, even though there may be some risk involved. He regards silver arsphenamin as the best form of arsphenamin, saying that

in its action it is much superior to arsphenamin sodium and neoarsphenamin, and is at least equal, if not superior, to arsphenamin (old salvarsan). He adds that silver arsphenamin is to be put on the market soon. He used no mercury or other medication in connection with the silver arsphenamin treatment, though he admits that possibly better results might be secured with a combination of silver arsphenamin and mercury. On account of the dark brown color and the lesser solubility, silver arsphenamin is more difficult to inject than arsphenamin sodium and neoarsphenamin. Injections improperly given are painful. He gives ordinarily 0.1 gm. as an initial dose for both men and women, and has seen no pronounced bad effects. He uses a 1 to 1.5 per cent solution. Twelve injections of 0.25 gm. each, given twice a week (3 gm. in all), constitute a vigorous course of treatment.

Hauser. Visceral Analgesia in Tabes. [British Med. Jour., April 3, 1920.]

This editorial comment says that the visceral crises of tabes may be easily mistaken for an acute abdominal emergency is well known. That visceral analgesia in tabes may mask the occurrence of such an emergency is less well known. Hauser of Mannheim recounts in great detail such a case. A man, aged forty-five, was suddenly taken ill after a meal, and retired to bed feeling sick, but did not vomit. Two days later a doctor was sent for, but beyond the fact that the patient seemed very ill nothing definite could be made out. The next day the man was obviously very ill indeed; he was collapsed with small, thready pulse, covered with cold sweat, and the heart was almost inaudible. There was no abdominal pain, either spontaneous or to be elicited by pressure, no rigidity, and no enlargement of the liver. But the pupils were fixed, the knee-jerks absent, and on questioning it was found that the patient had had syphilis for twenty years and had undergone much treatment. The man's condition becoming still more desperate, it was obvious that he was suffering from something more than a visceral crisis, of which he had had several. A surgeon called in diagnosed retroperitoneal blood extravasation. Saline infusion was twice given intravenously. The patient died three days after the onset of the attack; the only abnormal physical sign noted was a tympanitic patch in the left hypochondrium, diminishing the heart's dulness. At the necropsy a perforated duodenal ulcer was found, with general peritonitis and free gas in the abdominal cavity.

9. MENINGES.

Reiche, F. Influenza Meningitis. [D. Zschr. f. Nervenhlk., Vol. LXVIII, 69, 286.]

Reiche presents the results of examination of the cerebrospinal fluid in many cases treated by him during an epidemic of influenza. Lumbar puncture was made wherever there was severe stiffness of the spinal

column with pain in the head and neck or delirium. In most cases the fluid was sterile but only five cases showed normal fluid. Increase of pressure was evident but in seventeen cases without cell multiplication, in eleven with slight or more marked increase of cells. The cell count could not be made in two cases because of the presence of blood. Culture of fluid from three cases showed a mixed infection, pneumo- and streptococcus meningitis. Death, eighteen fatal cases those with sterile fluid, occurred chiefly from the pneumonia, also in cases which clinically showed only signs of meningitis, fifteen of twenty-nine cases, also in three of six cases with pronounced meningitis. The contrast between the severity of the symptoms and the slight degree of anatomical alteration in the meninges was often noted. Cranial nerve symptoms were absent. The author concludes from the generally negative result of culture that grippe and grippe meningitis are caused by a filterable virus and not by the Pfeiffer bacillus. Then the purulent meningitis caused by the latter has no relation to an epidemic of grippe as Reiche shows by two cases of his own. [J.]

George, W. E. Case of Tuberculous Meningitis. [Med. Jl. of Australia, Jan. 6, 1923, I, No. 1.]

Clinical study of a twelve year old boy who suddenly developed a severe headache which with other symptoms led to a diagnosis of typhoid. Laboratory findings were all negative. After two weeks the patient had a sudden chill. Four days later the leukocytes numbered 20,000, 90 per cent being polymorphonuclear cells. He became drowsy and the diagnosis of meningitis was soon evident. Death took place in three weeks. Necropsy showed an old adhesive pleurisy of the upper lobe of the right lung with numerous caseous tuberculous nodules. Both hemispheres were congested and the meninges in the vicinity of the pons were swollen by an inflammatory exudate. This exudate was clear and showed increased lymphocytes; no organisms were isolated on culture. The persistent leukocytosis with polymorphonuclear cell increase in an acute condition, as evidence of tuberculosis, is of interest from the diagnostic viewpoint.

Hermel, H. Encephalomyelomalacia Chronica Diffusa in Four Year Old Child. [D. Zschr. f. Nervhlk., Vols. LXVIII, LXIX, 335.]

Hermel reports a case to which he finds no parallel in the literature. Clinically it developed gradually in the fourth year of age with weakness, apathy, loss of power of speech, spastic paralysis of arms and legs, failure of abdominal reflex, bilateral Babinski, foot and patellar clonus, high grade ataxia. Negative Wassermann in blood and fluid. Death after some months followed upon marasmus and slight increase in temperature. Anatomically the entire medullary substance of the frontal brain, large surface portions of the central convolutions, of the parietal and occipital brain were changed to a gray discolored soft mass. The

cortex was peculiarly involved while Meynert's U fibers were spared. On the one hand there were spots with a more chronic process, proliferation of neuroglia with formation of very large neuroglia cells rich in protoplasm, the breaking up of tissue into a gross network, numerous granular cells of neuroglia origin, complete loss of the medullary sheath and of the axis cylinders. Nissl's ganglion cell change was very severe at the cortical divisions. On the other hand there were portions with more acute process, progressive softening of the entire medullary substance with complete destruction of all nervous elements as well as countless hemorrhages, but with no infiltrative processes. Clinically the case was diagnosed as encephalitis of unknown origin. Anatomically there was some likeness to the diffuse sclerosis of Schilder in the distribution of the process, but it differed in the complete loss of the axis cylinders and the absence of all symptoms of inflammation. The tendency to extensive hemorrhage is also peculiar. Bacteria or spirochetes could not be demonstrated. [J.]

Löwy, R. Acute Serous Meningitis. [Wien Arch. f. inn. Med., IV, Nos. 2–3.]

A statistical laboratory study with good bibliography from which, of 350 cases of serous meningitis, 425 lumbar punctures were obtained. Hexamethylenamin reactions lend support to the conception that the cerebrospinal fluid in normal conditions is a secretion, but when the meninges are diseased, it takes on more of the features of a filtrate. In every case the c.s.f. showed evidences of pathological activity of the pia. The term, acute serous meningitis, he concludes, falls short of expressing the condition in part of the cases, and in others expresses too much. In all infectious diseases with nervous disturbance, acute serous meningitis of the pia is evident. It ranges from simple toxic irritation of the vessels to severe injury of the vessels and plastic infiltration of the pia, all of which can be read from the lumbar puncture findings if properly interpreted.

Jakob, A. Paradoxical Cerebral Infantile Paralysis. [D. Zschr. f. Nervhlk., LXVIII, LXIX, 312.]

Jakob describes a case clinically and histologically which is representative of a paradox which exists in the absence of pronounced symptoms of paralysis. In this case there had been two severe meningoencephalitic attacks in the fourth and ninth years and since then epilepsy and mental weakness. In the seventeenth year, after temporary improvement, the situation had grown worse with confused states, suggestion of unilateral pyramidal symptoms, a forward swinging gait with stooping, status epilepticus and death. Histologically there were extensive meningoencephalitic foci in the frontal brain on both sides and in the left parietal brain including both cortex and medulla, and also widespread small lesions of encephalitic alteration. Further there was an elective lesion of the

ganglionic cells in the third cortical layer which extended far beyond the area of the gross lesion. This was found among other places in the otherwise normal anterior central convolution at the right while the Betz cells and the pyramidal tract were intact. The third of the three outer layers of the cerebral cortex, which are receptors in nature, is the most vulnerable according to Bielschowsky. Loss of small elements in the fifth layer, the ganglionic, seemed to result from the destruction of the elements of the third lamina just as frequently deterioration of the elements of Betz seems to be followed by loss of the ganglionic cells of the fourth layer, the inner granular layer.

Vaucher, E., and Schmid, F. Meningococcus B. Sepsis. [Bull. d. l. Soc. Méd. d. Hôp., XLVI, No. 26.]

This patient, a man forty-seven, had intermittent febrile attacks without indications of any localizing infection in meninges, joints or other habitus. The general health had not been much impaired. The symptoms persisted for three months unmodified by specific serotherapy, vaccines, or other measures. Finally, parenteral injection of 10 c.c. of milk was followed by complete recovery.

Wertheimer, P. Meningitis Following Spinal Anesthesia. [Lyon Chir., July-August, 1922.]

This clinical report is of a man of twenty-seven years of age operated on with appendicitis under spinal anesthesia with eight cgrs. of scurocaine. Three days later acute aseptic meningitis occurred. The following day the patient had a raised temperature, rapid pulse, and severe headache; Kernig's sign was positive. Lumbar puncture was performed, but no bacilli were found. Antimeningococcic serum was administered. The patient later exhibited all the signs of acute meningitis, but the spinal fluid contained no organisms. He subsequently made a slow but satisfactory recovery. This case was one of several to whom a spinal anesthetic was administered, and alone showed any ill effects. In this patient intravenous injections of a 30 per cent glucose solution relieved the symptoms, and the patient felt considerably improved, whereas lumbar puncture did not produce any result. It is therefore suggested that the injections provide a sure means of reducing the tension of the cerebrospinal fluid. [Author's abstract.]

Sahlgren, E. Circumscribed Serous Meningitis. [Hygiea, LXXXIV, No. 14.]

Clinical history of a woman of sixty-eight who developed spastic paralysis and paresthesia in the legs after a spinal trauma. The symptoms subsided after laminectomy, but the patient died of a pneumonia. Necropsy the thirteenth day revealed the spinal cord approximately normal. The compression from the circumscribed serous meningitis may have interfered only with the circulation.

Cramer, A., and Bickel, G. Is Tuberculous Meningitis Curable? [Ann. de Med., Sept., 1922. B. M. J.]

Cramer and Bickel observe that the unanimous opinion of several generations of physicians has been that tuberculous meningitis is incurable, prognosis fatal, and death inevitable. Everyday experience has confirmed this view. The authors then discuss the extreme gravity of this disease compared with other forms of tuberculosis. Ninety per cent of cases present other tuberculous lesions, often of the generalized miliary type; very frequently meningitis is a terminal development. The mechanical effects on such delicate structures are far more serious and rapid in action than in other organs. The toxin has an elective affinity for the central nervous system. In spite of all these facts cases of recovery have been recorded, though in the majority sufficient scientific proof is wanting. The authors record the case of a youth of nineteen, having a history of winter cough, etc., for several years, who developed typical tuberculous meningitis, the diagnosis being fully confirmed by bacteriological and experimental findings. Full details of the case are given. In all four lumbar punctures were performed during a period of twenty-nine days; the cerebrospinal fluid at the last puncture was normal and the patient was discharged, apparently completely cured, two and a half months after his admission to hospital. Eighteen months afterwards he was in excellent health, played games, and neither physically nor intellectually showed any sign of disease. The writers have collected from various sources about 250 cases of cured tuberculous meningitis. Rejecting all cases in which the diagnosis was not confirmed by discovery of tubercle bacilli in the cerebrospinal fluid and the infection of guinea pigs which had been inoculated with the fluid, they have found 45 cases which fulfill these conditions, of which particulars are given. The authors append a table of results in 40 of these cases whose ages have been given by the writers. This shows that whereas the percentage of recoveries below two and one-half years is only 2.5 per cent, that of patients above twenty years is as high as 30 per cent. The majority of authors who have published these cases think that recovery was due to treatment. That most generally employed is cerebral decompression, usually by repeated lumbar punctures; others have achieved this by trephining. Bier's treatment was employed in six cases, of which two are stated to have recovered. Tuberculin is recommended by several authors. "Autoserotherapy"—that is, subcutaneous injection of a few cubic centimeters of the patient's cerebrospinal fluid—has been employed with good results, but continuous drainage of the vertebral canal and puncture and irrigation of the cerebral ventricles have not produced any cures. Much depends on the patient's power of resistance and on the relative mildness of the infection.

III. SYMBOLIC NEUROLOGY.

3. PSYCHOSES.

Boisen, A. J. The Relationship Between Religious Experience and Mental Disorder. [Mental Hygiene for April, 1923.]

An article of 1,700 words setting forth the theory that the functional psychoses and religious conversion experiences are related to each other as opposite solutions of a common situation, a conflict within the personality, the one representing a happy solution and the other an unhappy solution or perhaps no solution at all, but merely a condition of unstable equilibrium with the result still in the balance. Such a relationship would account for the pathological phenomena which the religious genius frequently shares with the psychotic patient and suggests that the true line of demarcation between them lies not in the presence or absence of this or that pathological phenomenon, but in the result attained or in process of attainment in terms of character and social helpfulness and of the integration of the personality around what the individual himself conceives to be his purpose in life. Conflicts are in themselves neither good nor bad. They often represent an intermediate stage through which many individuals must pass if they are ever to reach a level of development at which their interests instead of being taken up with those things which make a man loathsome in his own eyes, become genuinely attached to things which have enduring value both for themselves and for the race. But conflicts may result either in victory or defeat. It is therefore important to take into account the character of the contending forces and the direction in which the personality is tending.

Such a relationship suggests the importance of coöperation between medical and religious workers in the treatment of certain types of mental disorder. The physician today as a result of his empirical method, his careful systematic study of living men and women, has in truth become a physician of souls, while the traditional "physician of souls" clinging to his study and to his traditional methods is tending to become merely a custodian of the faith. But the religious worker, with all his limitations, has yet in his philosophy of life, in the practice of prayer and in the influence of the group of socially minded people whose chosen leader he is, instruments of healing which are of fundamental importance. Such coöperation should begin in the way which seems simplest and most natural. The special trained religious worker reinforcing the medical work at the already established institutions for mental disorder by such insight and experience as he and his group may possess beginning himself to study carefully and systematically from the religion viewpoint the problem of mental disorder, and directing the attention of religious workers generally to the importance of learning to deal more effectively with the sick soul before the disorder reaches the more advanced stages. Such a plan by utilizing machinery already in existence could without

additional expense to the state greatly increase the effectiveness of psychiatric work both in the way of prevention and in the sympathetic oversight of discharged patients. [Author's abstract.]

White, Wm. A. Considerations Bearing on the Diagnosis and Treatment of Dementia Precox. [American Journal of Psychiatry, Vol. I, No. 2,]

This is a brief discussion of psychogenic factors in the cause and treatment of dementia precox with particular relation to the value of occupational therapy as a means for checking regression and offering facilities for adjustment which some cases of dementia precox are able to grasp. [Menninger.]

Spradling, R. H. The Patient with a Psychosis. [Lancaster Co. Med. Soc., April 17, 1923.]

"Self-preservation is said to be the first law of nature. This is not true in so far as it applies to the human race." At no time in history is it recorded that legislation has existed that would tend to improve the physical or mental condition of humanity. "Insanity, imbecility, and physical defectives are becoming more numerous." I wish to emphasize this fact, that insanity, imbecility, and physical defects are inherited. Approximately 75 to 80 per cent of all cases of insanity are inherited. Approximately from 10 to 15 per cent, or 18 per cent, depending upon the locality, are insane because of having had syphilis in years past, resulting in paresis. All cases of imbecility are inherited, as is also our physical make up. Every human life originates from a single fertilized germ cell. This cell contains elements which determine what manner of man or woman that cell will ultimately become. This cell contains elements which determine whether the person is to have blue eyes or black eyes, auburn hair or black hair, the contour of the face, head and body. It also determines whether or not the person will be normal mentally. The fertilized germ cell from imbecile parents will surely result in children who are mental deficients. The fertilized germ cell from dementia precox or manic depressive paients will result in children who, before they leave this sphere, will probably be in a hospital for the insane. There are thousands of persons who inherit a defective mentality who will appear to go through life in a very good condition, because their journey through life is such that they do not meet with serious troubles or afflictions, such as disappointment in love, financial reverses, etc. They have not had the "*active factor*" that causes them to become insane, and yet they may have inherited a defective mentality, or, in other words, an abnormal central nervous system. Infected teeth, love affairs, reverses financially, masturbation, influenza, child birth, the climacteric, and many other so-called causes of insanity never cause a person to become insane. They may be an active factor in bringing about the psychosis in remote instances, but you should remember that the person who becomes insane

inherits an abnormal mentality and the above named causes are but active factors in producing the psychosis. "A normal person, mentally, will not become insane from these so-called causes of insanity." Remember that insanity is always a chronic and an organic affliction, and that approximately no insane are cured. Often the manic patient becomes seemingly normal, but they are not cured because they are always subject to a relapse and they still have the abnormal mental make-up that they inherited. Dr. Copeland of New York City makes this statement, that heredity is not a factor in the production of insanity. Dr. Copeland says that Dr. Cotton of New Jersey cures 85 per cent of his insane. Can you imagine a more untrue and criminal statement to print and give to the public? Would either of these doctors allow any of their family to intermarry with an imbecile, a dementia precox or a manic depressive person? Conservative psychologists estimate that 20 per cent of humanity are morons and the percentage is not exaggerated. The morons are mostly at large and intermarry and reproduce their kind and they are usually prolific. In insane hospitals it is common to find practically whole families who are insane. Who would say they have not inherited their mental condition? Dr. Eliz. B. Thelberg of Vassar, a statistician, says 59 per cent of the insane have on record the fact that their psychosis has been inherited. There are surely more than 15 to 20 per cent of cases with no record. This verifies my previous statement that 75 to 80 per cent are insane because of heredity. After a number of years of close and intimate contact and treatment of the insane, I can not remember of one person that could be pronounced cured. Then why these untrue and sensational articles in magazines and papers to the contrary? These statements are criminal in so much that they mislead the public. To reduce insanity the public must be educated to the fact that insanity and imbecility are inherited and that to reduce their number, they must not be allowed to reproduce. Teach the public that heredity is the influence that forms character, and not environment. Teach them that we should spend more of our money in improving heredity rather than all of it, as we now do, in improving environment. "Quality, not quantity," is the slogan the human race is sadly in need of. The continued talk about race suicide is slush and there is no intelligent thought back of it. "The human race today is deficient, physically, and mentally, because of improper teachings along these lines. Teach the public this fact, that one-fourth of the American people are what are classed as "pretty bright," that three-fourths are classed as "pretty dull," and that the future of our country depends solely on whether the bright one-fourth or the dull three-fourths produce the larger families for citizens of the future. Educate them to the fact that it is necessary that the mental deficients be segregated or sterilized. If proper laws are passed and enforced, and this line of procedure is followed, generation after generation, in a few

centuries we would have a superrace as compared with the degenerated race that now exists. [Author's abstract.]

Janet, Pierre. A Case of Psychasthenic Delirium. [American Journal of Psychiatry, Vol. I, No. 3.]

This was the case presented by Janet at the American Psychiatric Association meeting in Boston, June, 1921. From the standpoint of the American psychiatrist the most interesting point would be Janet's inability to see that his psychasthenia group includes dementia precox cases and is not a valid classification. Such reactions as this are certainly not familiar in cases of what we in this country call psychasthenia. "I must suck the floor because the spittle I have thrown on it comes from my body and is the sacred milk of my mother." The patient was a girl of thirty-six first seen by Janet when she was twenty who has been mentally sick since that time, and three times during the sixteen years acutely, deliriously ill. The family history is bad, the child's physical health poor. For many years she was treated for stomach and intestinal trouble. She became tearful and depressed, then noisy, then restless, self-accusatory, sought for someone who might influence her. Developed meticulous scrupulousness as to cleanliness, modesty, etc. During the delirious attacks she put her ideas "into violent execution" and rushing about the room forces food into people's mouths and smears it on their faces, carries people in her arms to bed against their will, strikes at the doors and walls, spitting, urinating and defecating on the floor and bed, shouting obscenity at the doctors and nurses, covering her body and hair with her own feces and otherwise for periods as long as eighteen months doing all the things about which she had had compunctions and fears. Janet then discusses the important psychological features as to a disturbance of will, controlled by what he calls an "immediate assent" and a secondary or "reflective assent." [Menninger.]

Henderson, D. K., and Gillespie, R. D. A Review of Service Patients in a Mental Hospital. [The American Journal of Psychiatry, Vol. III, No. 1, p. 13.]

This paper analyzes the records of 113 "war service" patients remaining in a mental hospital several years after the cessation of the war. The investigation was undertaken to determine the outlook both from the personal and from the economic point of view in these cases. A survey of the existing literature showed that the danger of passing mental defectives and potential psychopaths into the army had now been frequently illustrated. The proportion of the various disease types has altered since the war period, so that dementia precox cases and mental defectives constitute by far the greater proportion of cases still under care. The etiological factors are divided into those existing before the war, and those associated with service. Of the former, insane heredity, psychopathic predisposition (personality traits of Meyer, Hoch, and

others), previous mental illness, constitutional inferiority (*i.e.*, mental or moral deficiency), and excessive alcoholism together accounted for 99 per cent of cases where full data were available. These factors were combined in many cases with physical inferiority, or with evidences of endocrine disturbance. Abnormalities in texture of hair, skin, and nails were more frequent in dementia precox cases than in the rest of the group. The etiological factors associated with the war included service, traumata, and infections. The average length of service of those who served abroad was two and a half times the average service of those who served only at home—suggesting a much higher resistance in the former. Only 8 per cent showed no factor other than service and only 3 out of 17 wound cases no factor other than wounds.

Various toxic infective factors yield a comparatively small number of disease pictures and these are much more commonly well defined psychoses than the simple infective exhaustive type. No new type of mental disturbance was produced by the war, but certain psychoses (dementia precox types) appeared in an acute recoverable form. More than half the cases remaining in hospitals are of the dementia precox group, and of these most are of the paranoid variety. This preponderance of the paranoid type is no more marked than in civil cases of dementia precox.

The mental status in nearly all of the dementia precox cases was one of considerable dementia. The inefficiency and lack of endurance of the mental defective group was strikingly revealed; but on the other hand, nearly half of the general paralytics had an average length of service nearly equal to that of the whole series. Finally, it is evident that very many of the cases under consideration would eventually have entered mental hospitals without the supervention of war strain, and that of those remaining under care, nearly all will have to reside permanently in an institution. [Author's abstract.]

Nunberg, H. Catatonic Seizure. [Int. Zeit. f. Psa., VI, No. 1.]

On the catatonic seizure. In the psychoanalysis of narcissistic neuroses difficulties are met with which are not encountered in the analysis of transference neuroses. These difficulties do not always arise, as might at first glance be expected, from the tendency in narcissistic patients to shut themselves off from the external world; for many of them feel at an extreme urge to communicate with others. The real impediment in the way of the psychoanalysis is that these patients have peculiar modes of expression and it is hard to interpret what they say. Often regression is so extreme that speech is no longer used as a medium of communication, but recourse is had to the more primitive form of expression, by means of actions. Another factor which may interfere with the analysis is the form of transference, which is often negative and may easily become a delusion of persecution, making all contact with the patient impossible. Yet there are cases in which these difficulties can be surmounted. Indeed it is sometimes easier to penetrate to the

psyche of the schizophrenic than to that of the psychoneurotic. Nunberg describes one of these accessible cases.

The patient was thirty-two years old, an intelligent and cultured skilled mechanic who had been successful in life until his disorder had made considerable progress, though he had always been obliged to struggle against homosexual impulses. The overt act which caused him to be placed in an institution was an attempt to violate his sister with whom he was living. The first time Nunberg saw him he was in a state of catatonic excitement—in a strait jacket and tied in bed. Two and one-half years before he had decided to make his home with his sister whom he pitied because she was so lonely. In this arrangement Nunberg sees a defense against the patient's homosexuality. Every succeeding defense set up in this same direction showed deeper regression in the direction of narcissism. Among these was a belief in the all powerfulness of thought, an effort to gain special recognition from those about him, a striving to become perfect through gymnastic exercises. He paid particular attention to breathing exercises, believing that he received special strength from the oxygen taken in with the air—from physiological combustion, through which he hoped his body would become more powerful—that it would undergo a certain regeneration. He followed the same idea in eating. After a time he began to believe that he was suffering from certain physical symptoms, as it were a realization of the combustion, that is to say a burning sensation in the loins and back. He also believed he had a hole in the umbilical region from which his life blood was oozing. In connection with these symptoms he formed a mother phantasy, saying: "In the midst of my suffering I thought that the mother suffers nine months before the child is born and that I would probably suffer nine months before my time of regeneration was completed." After being repeatedly questioned he explained his attempt to violate his sister by stating that great danger threatened mankind; it was in danger of dying out; that it was his mission to save the world and that he alone could continue the race by procreation; it was not his design to violate his sister but to unite with her.

It became clear from childhood memories that in his sister the patient was seeking himself. In the gradual narrowing of the libido to narcissistic interests she was the last love object, by means of which he strove to continue his existence and to rescue the dying world from destruction. It is to be noticed that up to this point the patient had distinguished between himself and the external world and had sought only indirectly to influence it, through some physical agency. After the "dying out of the world" the patient ceased to make any distinction between inner and outer, and the ego embraces the outer world. To use Tausk's expression, the boundaries of the ego are lost. The efforts to fructify the expiring world reaches its highest point in the desire to produce the fruit of his own body; the wish to save the world becomes the wish to save the self—the wish for regeneration.

Nunberg explains that, taken as a whole, the process is an effort to endow new objects of the external world with the superfluous narcissistic libido. But because the pathway for the libido which has been blocked could not be opened again, the regressive direction is taken until a point is reached where the parts of the person's own body, the organs, present themselves to the ego as objects. The efforts at regeneration through breathing exercises, producing oxidization or combustion, resulted finally in real somatic burning sensations. That these sensations were always heralded by numerous pollutions proves unmistakably, in the author's opinion, a connection between the bodily sensations and sexuality. The patient's own explanations and elaboration of his system showed that the organs as well as the excreta were regarded as parts of the external world, the whole process—the muscle innervations in the form of symptoms and the production of secretions, as saliva, etc., standing under the pleasure-pain principle and being efforts to attain pleasure in the organs. Calling attention to the difference between schizophrenia and the psychoneuroses, Nunberg says that in schizophrenia there is, as result of regression, a sharpened observation of self. The psychoneurotic, on the other hand must be led to turn his attention to the inner processes and to communicate the ideas which occur to him without exercising critique. In this way a condition is produced artificially in the psychoneurotic which exists as a result of the pathological condition in schizophrenia. The writer thinks that the faculty of self-observation may be localized in that part of the foreconscious presided over by the censor of consciousness. This censor possesses, as according to Bleuler, does attention, the capacity of making a choice and may grant to some ideas access to consciousness and withhold it from others. In answering the question: "In what relation does the attention to self stand to the censor of consciousness?" Nunberg refers to Freud, who set forth three great psychic institutions: moral conscience (from which is derived the sense of moral right); judgment of reality (the logical faculty); and the censor of consciousness; and gives as his own opinion that the censor seems to depend to a certain degree on the two other institutions. By regression of the libido the two other institutions are lost and the censor is weakened so that the condition corresponds to that stage of development where only the world of inner objects is perceived. With the weakening of the censorship of consciousness, the motor and secretory innervations are without inhibitions and proceed unhindered to the biologically purposeless affective explosions terminating finally in the outbreak of the catatonic attack. The attention to self is accompanied, then, by affect. Affect as is well known contains within itself a force which strives to repeat significant experiences. For the individual the most significant experience is his birth. As may be clearly seen, the patient, in his attack, reproduces his birth. The fully developed catatonic attack may therefore be regarded as a repetition of the first great affective outbreak in the life of the individual, namely, of the anxiety attending birth.

In conclusion Nunberg calls attention to marked similarities between the catatonic attack and the hysterical, as instanced in dramatization and anxiety. There is one signal difference, however: in hysteria the object is invested with libido, in the catatonic, on the other hand, the organs or parts of the body are emotionally invested. [Willard.]

Barrett, Albert N. Broadened Interests of Psychiatry. [American Journal of Psychiatry, Vol. II, No. 1.]

In his presidential address before the American Psychiatric Association convening in Quebec, June 6, 1922, Barrett sketches with swift strokes the newer conceptions of the psychiatric scope. Literature, characterology, music, courts, schools, departments of war and peace and many other phases of psychiatric work from the social side are referred to, while on the strictly technical side various problems of hospital and institutional development and treatment, psychiatric social work, psychiatric training, pathological and psychological researches are considered. The trend of the article is to show that in the face of rapidly increased opportunities and demands, the supply of capable psychiatrists, men who on the one hand can do it and on the other hand will do it, is painfully short. "Life is short, the art long. . . ." [Menninger.]

Myerson, Abraham. Anhedonia. [American Journal of Psychiatry, Vol. II, No. 1.]

Myerson includes under this title the syndrome seen in many psychoses and neuroses, characterized by a loss of desire and satisfaction in life with increased excitability. He ascribes it to an actual interference with the source and distribution of energy, and describes it as following the infectious diseases and operations, accompanying the menopause, evolved by certain environmental discomforts, preceding the outbreak of diagnostic phases of mental disease and sometimes occurring constitutionally or idiopathically. [Menninger.]

IV. SOCIAL NEUROLOGY, RELIGIOUS PSYCHOLOGY, MEDICO-LEGAL, ETC.

1. RELIGIOUS PSYCHOLOGY.

Róheim, Gáza. Sacred Money in Melanesia. [Int. Zeit. f. Psa., Vol. IX, No. 3.]

At one time it was believed that the remarkable uniformity in the customs of races living at distances from one another could only be explained on the ground of descent from the same stem and a wandering out from the same place of abode. Historical ethnology has now abandoned this idea, and in this article Róheim endeavors to trace the phylogenesis of the money interest, in keeping with the newer views, as a parallel to Ferenczi's "Ontogenesis of the Interest in Money" (see

Psychoanalytic Review, Vol. III, p. 469). In Melanesia money is called tabu, and in other countries with like levels of civilization money is given names which indicate its sacred character. At first glance one might be inclined to say that tabu here is really a protective sign for the purpose of warning, a magic prohibition of theft, especially as in some places the custom prevails of hiding gold and protecting it with a sign. Such explanations are insufficient, however, as taboo is not only a prohibition but always carries the meaning of something sacred. The close connection between money and death rites and gifts to the dead furnishes the necessary clue to the real significance of money. The writer calls attention particularly to Rivers' work in this connection. Mariner, in describing the death rites of a primitive people, relates that the graves are defiled by the men at night and cleaned by the women the next morning—a ceremony which was carried on for many successive days. Róheim draws a parallel between this primitive behavior and that of infants who yield excrement in return for the mother's milk, stating that the defecating on the grave of the leader of the tribe is to be regarded in the same light. This interpretation is confirmed by various elaborations of the cannibalistic phylogenetic rites and the infantile ontogenetic conduct.

Róheim concludes that the sacred character of money being taken into consideration, it can only originate in the parent images; phylogenetically in the father, the chief of the tribe, who in dying yields his goods and wives, and is symbolically eaten and repaid in gifts from the survivors' own bodies; ontogenetically in the mother, who gives her body for nourishment and is repaid in the excrement. "As so we come by this long journey," he adds, "to what we could have discovered at home. On every coin is the picture of the king, the father of the country. He gives himself thus piece by piece to his subjects." Historically there are other substitutes for the father, namely, the gods who were the predecessors of the kings: "The gods were the first capitalists of the Greeks and the temples were their banks" (Curtius). From the beginning two interpretations have been given the rites of offering or sacrifice, says Róheim, in discussing their connection with money: the sober rationalistic explanation, as a barter of gift for gift, and the explanation of the rite as an oral communion. Having discovered the libidinal origin of sacrifices, it is possible to do justice to both. According to the oral significance the child identified itself with the mother; the brothers of the original tribe with the dead father. On the other hand, in the sense of an exchange the child sacrifices its feces to the mother as a gift in order to continue to receive gifts; in the primitive tribe gold is strewn on the grave; among the Kabi and Wakki the wonderworker is elevated to the rank of a thaumaturgist of the first order by giving up to the spirit of the rainbow the quartz crystals and receiving in return the magic cord (the umbilical cord?). Róheim believes, therefore, that the infantile root of the offering

for gift is to be found in the infantile anal activities; the root of the offering in the sense of identification, in the oral activities.

Hinkle, B. Spiritual Significance of Psychoanalysis. [Br. Jl. Psych., Med. Sec., Vol. II, pt. 3.]

A gratuitous effort to make respectable that which does not need it. If a bishop is a crook, or a countess a prostitute, what of it? Psychoanalysis makes an effort to penetrate shams. Why gild it with an hypocrisy which it would repudiate in the gilding of others. An elaborate verbiage trying to say that Freud shows that we are "Devils" on the inside, but that Jung says we are "Angels." Naturally mankind will pay more to receive the message of their divinity than of their deviltry. Verbum sap—"One can catch more flies with honey than one can with vinegar."

Groddeck, G. Wishfulfillment in Earthly and Divine Punishments. [Int. Zeit. f. Psa., Vol. VI, No. 3.]

Groddeck states that in his early practice he was struck by the frequency with which he met with persons who believed that after death they would come to life on the planet Mars. Later he became acquainted with Freud's theories and was able to establish a clear connection between this belief and the wish to return to the mother's body. One patient himself explained the connection of this idea with the name of his mother. This same wish to return to the mother assumes other forms and invests other symbols. Among these Groddeck notes the belief that death is a seed leading to another birth and to resurrection. The idea of being eaten by worms, beside its obvious meaning in connection with death, has a more symbolic significance, arising from the association between worm and child. Also the widespread fear of being buried alive belongs here, as it is connected with the deeply repressed wish for incest with the mother and the longing for the fetal life which touches on the incest idea. From the prevalence in some places of the custom of burning the dead instead of burying them, Groddeck traces the idea of cleansing fire and the belief in hell. A series of analyses confirmed his view, convincing him that the association between fire and death still lives in the unconscious, though it has disappeared from consciousness. Various myths also show the connection between fire and love.

Groddeck goes into detail in the analysis of hell: It is a dark hole with an entrance in the form of a tube and with damp walls. In this hole burns an eternal fire and here the devil works, a hairy fellow with the well-known signs of lust, the foot and horns of the goat. Another instance of this same symbolism Groddeck finds in Bocaccio's tale of the maiden and the hermit. Individual cases which Groddeck analyzed furnish examples of special forms assumed by the idea of torture hereafter. In these were shown the connection between castration and the sexual act,

and between the flow of blood and emission (as in the legends of Salome and John the Baptist, of Judith and Holofernes, and of David and Goliath). To these associations he traces the popular excitement over executions, tales of atrocities in war, burning of houses, cutting off the breasts of women, etc. By the phantasies of one patient the connection between the medieval tortures of roasting and burning at the stake and the sexual act was illustrated. In reference to the black color attributed to the devil, Groddeck notes that burglars, murderers, bogies, and other objects of fear are imagined to be of this color, and that with this symbolism is connected the unconscious sexual aversion to dark colored races: black or brown stands for night, darkness, and excitement; white for daylight and respectability. Reference is also made to the connection between the symbolism of the devil and the anal erotic tendencies. Suicide phantasies, Groddeck affirms, are always in close symbolical association with the governing sexual trends of the individual. Thus with men shooting and hanging are the most usual forms, representing ejaculation and loss of erection; with women the forms of suicide oftenest met with are poisoning and drowning, symbolic of impregnation or falling from a height (from chastity).

2. SOCIAL PSYCHOLOGY.

Kelsen, Hans. State and Social Psychology. [Int. Jl. Psa., V, 1.]

This scholarly paper deals particularly with those considerations which tend to weld individuals into groups. The psychological foundations for this type of synthetic dynamism have had much light thrown upon them by Freud, particularly in his Totem and Tabu, and his Group Psychology and Analysis of the Ego and this paper would carry Freud's fructifying ideas into a field in which the author has identified himself and to which he has already contributed a study, "The Sociological and Juristic Conception of the State" (Tubingen, 1922). Causality is just as determined in human institution formation as in any other synthesis, be it NA + Cl, in salt, or in the vastly more complex combinations that made the Holy Roman Empire, or the present United States. The ordinary physical, chemical or biological processes, particularly the "affinity" concept, however, may not afford adequate modes of approach to the sociological phenomena of state formation. This is the present sociological concept. A sociology founded upon social psychology, the author states, would determine the nature of general and particular social phenomena and institutions along two lines. Firstly social facts are defined as mental processes, and secondly social factors result from specific psychical interactionism with other individuals. This reciprocal reactivity constitutes the reality of a social group. Impulses and purposes meet and bind a group. The nature and extent of the synthesis from a mere salute to a

League of Nations, from this aspect, is merely a matter of detail and quantitative dynamics.

This general concept the author holds is problematical in more than one respect and he would examine the concept from the standpoint of the "State." Sociologically and legally the "unity" of a state is an *a priori* assumption. All those who agree with the "code" constitute the "State." Thus the whole question of psychological reciprocity is open to question. How could it be determined anyway? Thus membership in a state means allegiance to a code, *i.e.*, to some type of fiction, and it is equally a fiction and quite unreliable, Kelsen states, that children, lunatics, sleepers, and hosts of others unaware of membership, stand in any psychical reciprocal relationship in the sociological bond. The marvel is that the complete coincidence of the causal sociological with the normative legal points of view, has not caused any perplexity (It does constantly in medico-legal situations in America. S. E. J.), and that the sociological reality called the state might differ very greatly in content from the legal state has not even been mooted.

Dissociating as well as binding forces must be taken into consideration for these are vital in the situation. How can the innumerable disintegrating reactions—conflicting purposes, etc., which exist in innumerable smaller groupings, be computed in the dynamics of the total reaction which gives rise to the theoretical legal or economic unity? How can consciousness of class antagonism be reconciled and united by common consciousness of stateness? Here *repression* as a mechanism must come into operation. The significance of an appeal addressed to political parties within the state in times of danger is that it forces back from consciousness the antagonisms that are fundamental for political group formation in order to make room for a state consciousness, so that those belonging *legally* to the state may also form a real *psychological* unity. How far this works in concrete instances is still open to serious study. An initial error is seen in the projection of the synthesis upon the object itself. To represent society as a unity held together by interaction between individuals, is an error which the author would examine in detail and endeavor to correct. People may not necessarily be bound together because of similar feeling or thinking, any more than because of similarity of noses or fingers. Group activities, among which mob violence may be taken as an illustration, do not result from inner reciprocating influences but rather from a common influence from without, *i.e.*, by a third party. The common feeling may increase the primary situation secondarily, as also in ambivalent directions—"as a sorrow shared is a sorrow halved." The primary situation however remains individual, and the generally held sociological hypothesis that proportional intensification of affect through summation of common feeling or common idea is operative, the author says must be refuted. The psychic elements of different individuals do not admit of summation, and even if such a sum could be cast

up it would not be the expression of a psychic reality. Common emotion, common volition and common idea can never mean anything more than a description of the coincidence in the content of consciousness of a number of individuals. Thus parallelism of reciprocal influences does not adequately envisage the phenomena. The principle of denomination, the leader and the led also is insufficient, and the author turns to discuss Freud's contribution to social psychology, namely the influence of the libido object. Le Bon's study is first gone into. His well known and often quoted psychical entity—the group mind—which arises within the society is outlined. Freud in his "Massenpsychologie" does not accept this generalization and holds fast to "individual" psychology. The "group" mind phenomena, Le Bon's collective psyche, are not new. They are "individual." The author then gives a résumé of the libido theory in general in order to render its specific application to group psychology understandable. The "libidinal structure" of the group conception is minutely analyzed. Freud's idea that such libidinal ties which result in group formation entail some sacrifice of narcissism is amply borne out by a multitude of phenomena. Identification as a mechanism plays a large role here. The emotional tie to a leader thus identified with self and displaced to the object. Man is therefore not a herd but a horde animal led by a chief. The ego and ego-ideal must be distinguished, the latter being a type of conscience, moral standard of unconsciously accreted "engrams." The chief takes the place of the ego-ideal. The group therefore is one united on the basis of a common ego ideal displacement to an object—the leader. The domineering jealous father in primitive society is the prototype of this leader. As the primitive man survives in every individual so the primitive horde may arise once more out of any random crowd.

Now arises the question, Is the "State" a similarly constituted group type? Freud would seem to say yes. His identifications and ego-ideals in the state groups follow similar lines to those seen in the primitive horde even though certain variations are manifest. The differences between the transient (mob) and stable (state) groups are really so great as to perhaps require other formulations. In the stable groups the regressive factors have undergone considerable modification. Organization, as outlined by McDougall, is admitted but needs clearer delineation if the libido theory be applicable. Kelsen here attributes Freud with a conceptual error. The stable social "organization" does not possess those identification and ego-ideal substituted figure phenomena, he states, and hence are not "groups." But they do cohere in some sense. How? In Freud's discussion of groups with or without a leader "Ideas" take the place of the leader in the latter grouping. The "State" now becomes the "guiding" idea to stand as the recipient of the libidinal ego-ideal impulses. The author now progresses to a discussion of Durkheim's sociological conceptions which are more clearly

analyzed in the light of Freud's individualistic conceptions, particularly with reference to the ethnological ideas concerning the Totem. Here one finds the roots of social unity behind a religious procedure. Here the author commences to depart somewhat from the conceptions of the formation of a legal state. Early law concepts are essential to outline the state. The king (father) must have been the prototype of the law giver. Politics arose, which, the author states, is still in a lamentable state from the standpoint of science. Whether the state makes the law or the law the state is one of those pseudo-problems so often seen where, after cause and effect are in reality ambivalent unities, "mind and body," "soul," "God," theology and politics, and a host of similar pseudo-problems are given in illustration. Thus the state is shown as a deity idea because it rests on a dualistic system characteristic of the theological method, that is to say, because it was evoked as a hypostatization of the unity of the legal code, in contrast to this and as a transcendental being, in the same way as God, as a personification of nature, was evolved as a figure transcending the latter. The theological method should be avoided in the mental sciences and especially in the social sciences. The prevailing dualistic system must be eliminated. Inasmuch as Freud has more clearly shown the individual psychological origins of theological conceptions and put the old magical terminologies into scientific form he has rendered an important preliminary service to the science of sociology.

Jelgersma, H. C. Peculiar Custom on Marken Island, Holland. [Int. Zeit. f. Psa., Vol. X, No. 3.]

Jelgersma seeks explanation for a custom prevalent on the Island of Marken, which he considers interesting as an example of primitive usages in the midst of a highly civilized race. This island, now having about 1,300 inhabitants, was settled in the thirteenth century by Frieslanders. These islanders, for the most part engaged in fishing, have led an isolated existence. The custom to which attention is called is that of making boys wear girls' dress until they reach the age of seven years, at which age they are dressed exactly like the men, in short wide trousers and tight jacket.

Rejecting more superficial explanations, Jelgersma says: Seeking the source of this humiliation, only two persons have the power of bringing it about, namely, the father and the mother. Our knowledge of hidden human impulses in the light of psychoanalysis permits us to regard the father as the parent who humiliates the boys of the Island of Marken. It is the father who has reason to fear his son and who wishes to repress his potency. Remarkable is the fact that as soon as the boys reach the age of seven they are given the clothing of men—a circumstance which helps to solve the riddle. The men spend most of their time on the sea, while the women remain on the island with the children. For this reason we are justified in assuming that at one time there were few schools on

the island and that the boys began to help the father when they were seven years old, and were thus withdrawn from the society of their mothers and sisters. The degradation is therefore explained as a protection against the incestuous inclinations of the sons. A similar usage, which is almost "magic," we find in Freud's "Totem and Taboo," where a similar explanation is given. In the writer's opinion one ground for the custom may be sought in the fact that the inhabitants of Marken Island have been shut off from the rest of the world for many centuries and have consequently intermarried. The incest which they so greatly fear is then no phantasy on the island, but in the course of the centuries must really have taken place repeatedly. It is noteworthy that on Marken a law against marrying strangers is effective, which in so small a group is really a command to incest. This is just the opposite of the excessive prohibition of incest in totemism, but both command and prohibition originate from the same source, namely, the incest awe. The remarkable device taken to avoid incest, namely, of disguising boys in girls' dress, shows us that the inhabitants of Marken are also not inclined to let it go unpunished.

Pfeifer, Sigmund. QUEEN MAB. [Int. Zeit. f. Psa., Vol. IX, No. 3.]

Pfeifer regards Mercutio's phantasy in Romeo and Juliet as one of the most interesting in literature. The phantasy in part reads:

> O! then, I see, Queen Mab hath been with you . . .
> She is the fairies' midwife, and she comes
> In shape no bigger than an agate-stone
> On the fore-finger of an alderman,
> Drawn with a team of little atomies
> Athwart men's noses as they lie asleep;
> Her waggon-spokes made of long spinners' legs;
> The cover, of the wings of grasshoppers;
> The traces of the smallest spider's web;
>
> . . . . . .
>
> And in this state she gallops night by night
> Through lovers' brains, and then they dream of love;
> O'er courtiers' knees, that dream on curtsies straight;
> O'er lawyers' fingers, who straight dream on fees;
> O'er ladies' lips, who straight on kisses dream; etc.

The phantasy which recalls the grotesque mingling of images when one is falling asleep, Pfeifer studies with the aid of dream analysis and ethnology, and finds that Queen Mab owes her wishfulfilling power to her origin from the mother imago, and that the phantasy itself, in all probability, originates in the incest wishes of the poet. In the introductory picture the figure of the mother is projected into the supernatural. Every actual wish which is constantly reaching out for fulfillment is referred to the gracious fairy, to the good mother of childhood. It is the love of the

mother alone which is able to still the longings of the child, to remove his fear and anxiety in the darkness of the night, but this beneficent image is destined to repression, and in the defense against the incest wish it becomes transformed into an evil image—a witch, clothed with the night, the symbol of anxiety. In spite of the repression, however, the erotic wish of the poet breaks through, and the witch becomes metamorphosed into the fairy Mab, endowed with wishfulfilling powers.

The writer notes that this motive for this wishfulfilling power was also to be sought in the burning ambitions of the young Shakespeare who had but recently arrived at the great city and the rich court. He saw the fame and riches he longed for represented in the great Queen. As the reality of the day held but little promise of the fulfillment of his desires, the little Queen Mab, the tiny image of the great Queen,

> Not larger than the agate-stone,
> On the fore-finger of an alderman,

the mother who had become a fairy, was the only one who could, in phantasy, grant happiness to her poet son.

Greig, J. Y. T. Freud's Theory of Wit. [Br. Jl. Med. Psychol., Vol. III, p. 51.]

A discussion of Freud's work on "Wit and Its Relations to the Unconscious." He first calls attention to E. B. Holt's portrayal of Freud's conceptions, which he terms inaccurate. With Freud's conception of the mechanism lying behind "tendency wit" Greig says he is in agreement, but he is not so certain—in fact disagrees with the mechanism laid down for "harmless wit." He disputes the validity of the "objectless" aim of this type of wit and also the mechanism of the economy of effort. His argument (p. 57) of the fatigue of the hearer of wit is not particularly convincing.

Flower, J. C. Suggestion. [Br. Jl. Med. Psychol., Vol. III, No. 1, p. 39.]

An interesting and exhaustive historical résumé of the various definitions given of suggestion up to but not including the period of psychoanalytic investigation.

Book Reviews

von Kries, Johannes. Allgemeine Sinnesphysiologie. [F. C. W. Vogel, Leipzig.]

Since, and possibly before, the days of Protagoras, when he stated most clearly that "man was the measure of all things," it has been increasingly borne in upon us that we build up the world of experience in response to our sensory stimuli. From a kindergarten, or medieval physiology, we have left the five senses, and newer histological techniques are discovering new types of sense organs almost yearly.

When the significance of energy conceptions commenced to be applied to biological behavior and it became thoroughly realized chiefly through the work of Müller, Hering, of Mach and their disciples that the human being was not a closed energy system, made up of a conglomerate of separately functioning organs, but a synthetic whole which captured, transformed and delivered energy in behavioristic pattern (entelechies Aristotle named them) of many years of formation (instincts) or mnemic patterns of later writers, then the "sinnesphysiologie" of Johannes Müller commenced to take on an increased importance in the understanding of metabolism and behavior.

Should one be interested in a very thorough and up to date discussion of the many problems which flow out of these earlier premises, this fascinating volume from von Kries, professor of physiology at Freiburg, is to be most warmly recommended.

It is a general physiology of the sensory organs, not a detailed study of one or more of these, such as Henning's recent masterly presentation of the olfactory sense, or of the earlier study of Helmholtz upon physiological optics. Especially important are some of the compounded syntheses of simple sensations such as the "time sense" or the sense of "spatial relations," and the final associational processes by which the mere compound and higher psychical functions are developed.

This is a very thought provoking and satisfactory work.

Pottenger, Francis Marion. Symptoms of Visceral Disease. Third Edition. [C. V. Mosby Company, St. Louis. $6.50.]

We congratulate Dr. Pottenger upon this third edition. No greater contribution to the understanding of the problems of internal medicine has been made than this work.

The understanding of Vegetative Neurology is a *sine qua non* for the interpretation of visceral disease. We hazard the opinion that an internist ignorant of its significance can never rise above being a

quack—no matter what his moral attainments may be—with the qualification that his quackery may be entirely unconscious.

The conception that an "Organ" can have a function separate from other structures of the body is a medieval fiction. The vegetative nervous system is the connecting switchboard that permits the automatic integration of the entire body. Even the so-called simplest general functions, such as temperature regulation, water regulation, salt distribution, etc., are under the generalship of the vegetative nervous system.

The general simpler truths are here outlined by Pottenger and are valuable. He has rearranged his material—more after the pattern of the chapters in Jelliffe and White, with the later editions of which, however, he has not kept pace, particularly as to the interbrain synapses.

One important defect is present in the book. The energic concept of the bodily mechanism and its important implications is not stressed, and the significance of the symbolic life of the community is overlooked. Man is too much of a physico-chemical mechanism in this book.

Barrett, E. Boyd. MAN, HIS MAKING AND UNMAKING. [Thomas Seltzer, New York.]

This is a work dealing with the genetic psychology as applied to human behavior. It is written by a one time professor of psychology in the Georgetown University at Washington. It is but one of five he has contributed and is for the man in the street, and an excellent book it is.

It is even in tone, evidently from one who has not read it in a book but has touched real life, and although not overtly Freudian, the author has the honesty to see and say much about the psychology of the unconscious from the Freudian viewpoint. In this respect he differs from narrower doctrinnaires in his own and in other folds.

He would apparently belong to the progressives of the Catholic Church—a large body in the European church—who realize that progress really is possible and that the past did not contain all that was good and worth while.

It is a very stimulating and valuable book for the lay as well as professional reader.

We consider it in the main one of the soundest books along this line we have seen for some time. It has the great quality of being human.

Dupré, Ernest. PATHOLOGIÉ DE L' IMAGINATION ET DE L' EMOTIVITE. [Payot, Paris.]

Anyone who came in contact with Dupré could not but be impressed with his intelligence, his charm, and his singular facility of expression. And yet he was not an original thinker, although he had a remarkable capacity to put old things in new forms.

The reviewer attended many of his medico-legal discussions in the old "Conciergierie" on the Isle de Paris. He often enjoyed the

companionship of one of America's most respected neurologists upon these occasions and profited by Pearce Bailey's better acquaintance with French as Dupré discussed many of the subjects set forth in this most interesting volume. Here he labored with the prison population of Paris and made them eloquent, for eloquence was one of his most notable attainments. We find it in these writings collected after his death.

Those interested in one of the most intriguing figures in French psychiatry, much obscured in arduous practical work during the many years of the war, will find this a most fascinating series of papers.

Colella, Rosolino. INSTITUTO DI CLINICA DELLE MALATTIE NERVOSE E MENTALI D. R. UNIVERSITA DI PALERMO. [Stabilemento d' Arti Grafiche, Palermo.]

Professor Colella has here collected in a single volume of reprints the work which has been carried on in his neuropsychiatry clinic at Palermo. There are twenty-six contributions by himself and his associates, de Giacomo, de Renzo, Lougo, Amodeo, Tripi, Bonasera, and Rivela; Colella has contributed the greater number.

He has dealt with the Reforms in the Italian Schools. Here are to be found some very sound notions concerning public educational problems: Tuberculosis, neuropsychiatry and delinquency, Traumatic neuropsychoses and arteriosclerosis, Delinquency and simulation, Divorce, Italy after the war—these are among the questions discussed by him.

We cannot pick out among these studies any that call for special mention. They are all of interest and reflect the excellent work going on in this clinic.

Wanke, Georg. PSYCHOANALYSE. GESCHICHTE, WESEN, AUFGABEN UND WIRKUNG. [Carl Marhold, Halle.]

The author has been interested in psychotherapy for a number of years as a part of his general medical practice and relates how little by little he came to realize the increasing importance and value of the psychoanalytic principles.

He had followed the general technical developments of the hypnotic experiences with considerable interest, always with a certain reserve founded upon a larger philosophical background. Like many another, he was not entirely satisfied with the results nor the theoretical considerations that grew up around the hypnotic work. In 1896 he began to study the work of Breuer and Freud, and following the development of the deviation in teachings of Freud from those of the hypnotic theories, grew more and more absorbed in the dynamics of the unconscious. He finally became convinced on theoretical as well as upon practical considerations that here were matters worthy of serious attention.

This book is a result of his experiences from these beginnings. It has been written in a more or less popular manner intended for physicians, clergymen, jurists, parents, and teachers. It is a very

readable volume seen from this viewpoint. It does not enter deeply into the deeper dynamics of the psychoanalytic theory, but seems quite reasonable and a worthy contribution to the general psychoanalytic literature.

It is especially of interest in that it reflects the experience of a serious worker in nervous disorders with a large background of practical experience and evidently a physician of wide and deep culture and solid attainments. This is not the work of a journalistic or superficial fly by night, which has marred the psychoanalytic landscape in this country.

Clark, L. P., Meyer, A., et al. STUDIES IN PSYCHIATRY. By Members of the New York Psychiatrical Society. Vol. II. [Nervous and Mental Disease Monograph Series, No. 41, Washington and New York.]

This semi-private society was founded in 1903 and some years ago published a Vol. I which contained a number of important papers reflecting the interests and activities of the society.

After a lapse of some years this second volume has appeared. It is approximately of the same size—230 pages—and contains twelve papers, together with lists or the officers, the members, and of the papers read since the appearance of Vol. I.

With but few exceptions the papers have been printed elsewhere. Dr. Phillip Combes Knapp has contributed a study on the Treatment of Mental Disorders in General Hospitals; Dr. Adolf Meyer one on Objective Psychology or Psychobiology. Dr. Chas. I. Lambert has a well illustrated article upon Alzheimer's Disease. Dr. Pierce Clark has three studies, one upon Psychopathic Children, another upon Some Therapeutic Considerations of Periodic Mental Depressions, and the third upon a Psychological Study of Stealing in Juvenile Delinquency. Dr. M. C. Ashley discusses a medicolegal subject of How the Court Rushes in Where Physicians Fear to Tread. Dr. Macfie Campbell also has three studies: On the Mechanism of Convulsive Phenomena and Allied Symptoms, A Case of Childhood Conflicts, and On the Mechanism of Some Cases of Manic Depressive Excitements. The book closes with two papers by Dr. Smith Ely Jelliffe—one a combination, rearrangement, and elaboration of two previously printed papers—a Neuropsychiatric Pilgrimage, detailing certain European situations after the war, and a paper upon Paleopsychology.

The series is an excellent indication of the good work that this society is carrying on, and the papers themselves are well worth having in this collected form.

Obituary

NATHAN E. BRILL, M.D.

Whereas, in the loss we have sustained by the decease of our esteemed colleague, Dr. Nathan E. Brill, we, the members of the New York Neurological Society, are desirous of testifying our respect for our departed fellow-member, and of expressing our heartfelt sympathy with the family in their great bereavement, and with the medical profession on the loss of one of their ablest and most enlightened fellows. Therefore, be it

Resolved, that we express our sincere condolence to the family of our deceased confrère in this, their hour of affliction.

Resolved, that the New York Neurological Society has lost one of its most valued and respected members.

Resolved, that the entire medical profession, of which our fellow-member was a shining light, has sustained an irreparable loss.

Resolved, that this expression of our sentiments be duly inscribed on the records of the New York Neurological Society, and that a copy thereof be transmitted to the family of the deceased.

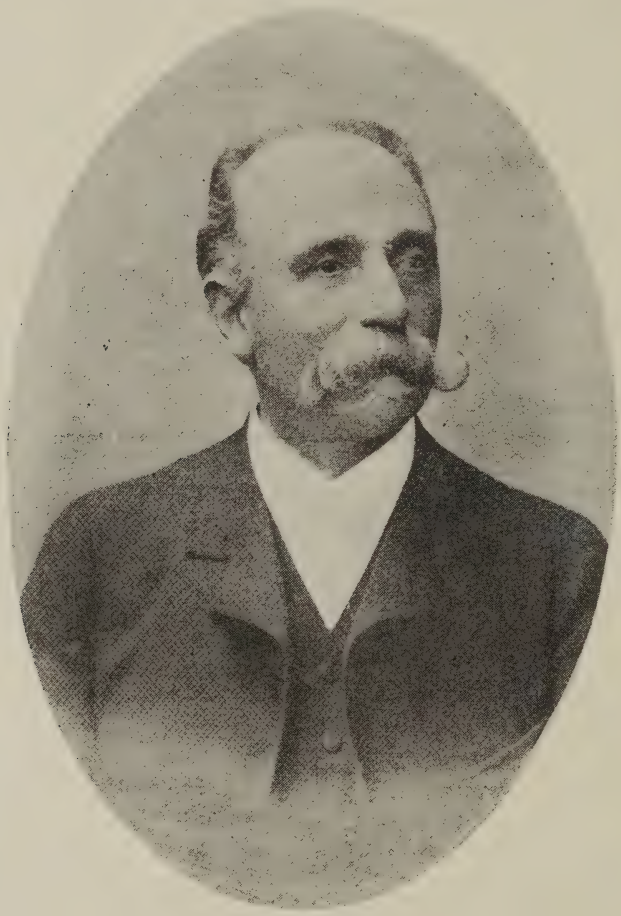
Isador Abrahamson
George H. Hyslop
Moses Keschner
Committee

PROFESSOR CAMILLO GOLGI

Camillo Golgi was born July 9, 1843, at Corteno. He completed his studies at the University of Pavia in 1865, and was appointed extraordinary professor in that university in 1875. After being professor of anatomy in Siena for less than a year, he was appointed professor of histology in Pavia in 1876, and professor of general pathology there in 1881, which position he held up to the time of his death, January 21, 1926, which resulted from septicemic complications of a boil upon his face.

Professor Golgi's researches into the minute anatomy of the nervous system and which were mostly carried out in the pathological

institute inaugurated by P. Mantegazza, carried on by G. Bizzozzero and then by Golgi, were of fundamental importance. His name will be forever intimately associated with this great field of knowledge. He invented a method of staining by impregnation with silver chromate, which demonstrated the structure of nerve cells in a manner



Camillo Golgi

which previously had been quite incomplete. The application of this method in the hands of Golgi himself, Ramón y Cajal, and others, provided the chief histological evidence for the neurone doctrine originally propounded by Waldeyer. By Golgi's silver method the reduction is confined to individual cells, together with their processes—namely, the axis cylinders and the dendrites—and the stain

does not extend into neighboring neurones. In the cells of Golgi Type I the axis cylinder is a long single process which becomes part of a medullated nerve fiber; this is exemplified in the pyramidal cells of the motor cortex, the anterior horn cells of the spinal cord, and the Purkinje cells of the cerebellum. Such an axis cylinder ultimately expands into an arborescence around the cell body of a second neurone. In the cells of Golgi Type II the axis cylinder breaks up at once into a wide ramification; such cells are found in the posterior horn of the spinal cord and in the granule layer of the cerebellar cortex, and are believed to have a distributive function, bringing a single neurone into physiological contact with many others.

Professor Golgi also described a special form of nerve ending met with in tendons, and known as the "organs of Golgi," and another type of nerve ending in the subcutaneous tissue of the pulp of the finger under the name of Golgi-Mazzoni corpuscles.

The main achievement of Golgi's life was the work he did on the minute anatomy of the nervous system, and he well deserved the Nobel prize he received in 1907; but he did pioneer work also in the investigation of the malarial parasites. After Laveran had made his discovery in 1881, Golgi, in 1886, demonstrated the life-cycle of the parasite in man and the relation between the attacks of fever and its sporulation; later on he distinguished the parasites of quartan and tertian malaria.

He was made rector of the university for a number of years and was also appointed Superior Counsel of Public Instruction, and Senator of the Crown. During the World's War Golgi instituted the first neurological center. He was not only a glory to his university, but nationally and internationally a supreme figure in anatomical science. [JELLIFFE.]

FRANZ TUCZEK

The death of Franz Tuczek at Marburg, December, 1925, brought loss to the field of active psychiatric service and to the large circle of those to whom his personality was known. His keen and buoyant interest in his profession was an indication of the vitality of a nature alive also to social and cultural interests and to the welfare of his patients. It led him also in untiring devotion to the development and extension of his institutional and educational work in psychiatry and neurology.

Tuczek was born in Cologne in 1852. He studied in Vienna and

later under C. Westphal, and became assistant at the *Landesheilanstalt* of Marburg, and later director of this institute and of the psychiatric clinic of Marburg. He founded the new psychiatric and nervous clinic of Marburg. He took his degree in 1884. He became professor of psychiatry in 1894, the date of his appointment to his directorship. About 1914 his service was partially interrupted by a protracted nervous exhaustion, but he resumed his duties as one of the most active of the faculty.

His scientific publications began with his studies in pathological anatomy and in the pathology of dementia paralytica, which he made the subject of his inaugural dissertation. It was he who discovered the early and constant disappearance of the medullary sheath in the tangential fiber region, especially of the frontal lobes. He confirmed the associated affection of the spinal cord. During an extensive epidemic of ergotism in Hesse, 1879, he devoted himself to the investigation of this disease. He described the systematic degenerative disease in the region of Burdach's column, though he did not succeed in a thorough understanding of its pathology.

He was always thoroughly alive to the relation of psychiatry to practical social life. He was an ardent combatant of alcoholism from a scientific point of view.

JELLIFFE.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

Vol. 63 MAY, 1926 No. 5

The Journal

OF

Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

Original Articles

THE ANCIENT IDEA OF CONSCIOUSNESS AND THE HUMAN MIND

By Jonathan Wright, M.D.

Truth is unattainable, as is to be inferred from the doctrine of Protagoras and by the doctrine of Democritus; if attainable, it would not be recognized if attained. This might well be regarded by the theist as the divine providence of God, for if it were attainable and recognizable man would soon attain it and then die of ennui.

The soul for the modern philosopher has chiefly an historical connotation. He prefers to discourse under the headings, mind, sensation, knowledge. In psychology, which owes its name and origin to discussions as to the nature of the soul, we seldom hear it mentioned. Among the ancients soul had far more a physical and physiological meaning than a theological one. Cognition was a function of the soul and the most interesting part of it for us is how out of physical and physiological phenomena consciousness, the "common sense" of Aristotle, arises, and yet the mechanism of sense really plays a subordinate part in their metaphysics.

It is chiefly from the *Metaphysics* of Aristotle and his discourse on the soul, and especially from the *Timaeus* of his great master, that I shall derive the headings of what I have here to say, hoping at the same time I shall not thereby overstep the limits of modern psychological interest into the territory of philosophy so far as to move the editor to drop this in the waste basket or feed it to the office cat. This is more likely to occur when one writes of the mind and its functions than when one deals purely with the mechanism of sense, for Plato insisted* that Ideas, which were his realities, were

* Platonis Opera, Burnet, Oxford and Clarendon Press, IV. Timaios, 51, c, 5; Politeia, 524, b, 10.

self-existent, though unperceived by sense. This, I suppose, is a heresy and a hoary anachronism in modern psychology. Possibly it may appear in its literature now and then as a heresy sprung anew from some ill balanced and uninstructed novice. What is more clearly established than that there are not only no such things as innate ideas but no ideas arise except directly or indirectly in the human mind through the senses? Even our idea of number, from which the marvelous science of mathematics has sprung, with its conclusions so irreconcilable to the senses, arose, as Aristotle pointed out,† from the observation of the discontinuity of units. This has always seemed to me hardly to cover the phenomenon, and I have been very much inclined to the Pythagorean idea of number as something divine, in so far at least as it is incomplete. Whenever I encounter such expressions I translate the divine into "something not fully understood" out of deference to certain friends of mine in science who shy at "the divine." I am sure there is something, at least for me not fully understood about the figuring, whereby our senses are in the end outraged by Einstein, his predecessors and followers. If it is "beyond sense," why is it not divine? At least it is metaphysics. It leads to conclusions far beyond sense, beyond physics, to things which physical science has often no way of investigating either by observation or by experiment. As we shall see in the argument of Plato, what is perceived by sense is a matter of opinion, but things arrived at intuitively (we would say) join with things arrived at by the help of numbers. These for him are the real realities. Other things are apparent realities. Twice two is four, but if experiment or observation fail to confirm it, is it therefore unproved? As the consequences of the development of the multiplication table go on, how often do they need confirmation? Naturally we answer, as often as a new factor is introduced in the equation.

If, as Aristotle states and as Plato leaves us some reason for asserting, number sense is a deduction from seeing two or more things separate, only if from the opposites being compared—unity with multiplicity—fundamentally then number is derived from sense just as bitter is—our concept is experimentally formed by comparing bitter with sweet. Telling the bitter from the sweet does not carry us very far or very surely, and in this at once we find a contrast with twice two is four. Now a man may see double when drunk—or, in these dry days, from muscular asthenopia or some obliquity in the

† Aristotle De Anima, Hicks, Cambridge University Press, 1907, 425, a, 19.

curvatures of the cornea or the lens. In this way, then, what one sees is a matter of opinion, but twice two always remains four, whatever anyone's opinion may be, drunk or sober. Our idea of space and time too we arrived at by a sort of spurious reasoning based on observation. How can a thing exist without there being space for it to exist in? We get that difficulty brought to our attention by Plato, but in Plato as well as in the most modern of assertions we receive the impression by the study of relativity that the notion of space is only for man's convenience. Time and space exist only by the observation of the passage of matter and energy from one point to another, is the modern explanation. We will find the same conclusion arrived at from a very different avenue of approach by Plato. By the means of the science of numbers, whatever may have been its lowly origin, we have been compelled to admit—more easily since the days of daylight saving—that we don't know whether it is two o'clock or not. This puts it in a different class from the knowledge of the bitter and the sweet. If number is not divine it is certainly "hard to understand" its success in making us doubtful whether it is two o'clock or no time at all. Our very consciousness seems to assure us our position in space.

At any rate it is no wonder Plato regarded number as partaking of the divine. To prove to a man that he is dreaming when he thinks he is occupying space does vastly more than shake his confidence in the ordinary testimony of the senses. On reflection he perceives, if Aristotle is right in tracing the origin of sense number back to perception by the eye sense or the ear sense or the touch sense, and, as in matters of sense, if there is multiplicity in opposition to unity, his senses being accused, he has no right to place implicit confidence in number either—but we do—no, there is something divine in number, even if I, a twentieth century inquirer, start out with the premise of a century twenty-five hundred years ago. If self-existent ideas are the true realities, if they are divine, then it seems very likely at least that mathematics furnish the link between sense and supra-sense, between physics and metaphysics. We need have no fault to find with Haldane when he says to study psychology before we understand the physiology of the brain is like trying to understand physics without a knowledge of mathematics. We need not quarrel with him at least because we see he is, not hidebound perhaps, but he is bound down to the definition of psychology current in this generation, which ignores the soul. That is not the permissible definition for the ancient psychology nor etymologically for any psychology. Psychology is the science of the soul. Of the ancient

psychology it will be the waste of no man's time to know before he enters modern psychology, and it would not be a bad idea either for the future physicist to know something of ancient metaphysics. He would not run so much danger of being hidebound in after life, not so apt to think his generation had accomplished all, not so oblivious to the approach of a new generation.

However, we can find in the old as well as in the new philosophy a contradiction to Plato's idealistic tendencies, and from both, by totally different methods, we can arrive at the conviction that consciousness is dependent on sense for the origin of many of the phenomena it presents, but let us not be too sure it can be all thus explained. Neither Aristotle nor anybody else can explain consciousness. Something very like consciousness is implicit in his word "common sense," but a mystery only looms the larger when part of it ceases to be a mystery. When he says* his "common sense" is a synthesis of the work of the perceptive faculties of all the senses, we take note it is not identical with the view of Descartes, who was sure he existed because he thought. Apparently neither Plato nor Aristotle, even in the light of the discussions which raged in Athens around the doctrine of Protagoras, fully comprised in any one term our meaning of consciousness which has come to mean so largely our consciousness of existence. But we see how involved this is with the question posed by Protagoras and wrestled with by Socrates whether we have a right to be sure of anything the senses say to us. Descartes said he knew he *was* because he thought, but if you trace the higher synthesis of thought (it was that he meant and it is what we mean by thought) back to the senses we arrive at the view confronting that of Protagoras. We know we *are* because our senses tell us so. Now we succeeded in getting back to the origin of mathematics and the number sense by saying it was a derivative of the other senses. We have arrived through Aristotle also, we see, at the derivation of all thought from the senses. Plato's Ideas even, in this view, have their origin in the senses, and there is no contradiction in Descartes. There is an advocacy in modern science that consciousness as we understand the term is all derived from sense. Well, that is a tremendous responsibility placed on a minute colored speck of protoplasm out of which in ten million years there evolved the nervous system, just an infrascopic speck, holding the potentiality of grasping the entire plan of nature, if we are to believe our materialistic friends. That's a large job. It is just

* De An., 425, a, 27.

about as incomprehensible as consciousness and number and the Virgin Birth, or any other miracle we find it "hard to understand"—something divine.

Yes, consciousness in disclosing even this world of sense to us, and mathematics in telling us so much of other worlds beyond the grasp of sense, really seem to have something divine about them, something we don't just understand. We labor hard enough to grasp our consciousness, but how can we? Many years ago, by a laboratory worker then ignorant of ancient psychology and ancient metaphysics, the suggestion was made that the lipoids or lipo-proteins, playing such a large part in cell metabolism, such a preponderating part in nervous cell metabolism, quickly dissolving in the anesthetics, might be the material basis of consciousness. Inhale ether and chloroform and you lose consciousness because the blood has borne them to cells in the brain very largely made up of lipins, and these depending for their function on various biochemical activities largely expressed by a word then with more meaning in it than at present, surface tension. A solvent for fat then is capable of wiping out the whole sensible universe, so far as we are concerned. A distinguished member of our profession was impressed with the idea that at last very likely we had arrived at a physical conception, at a concept no scientific man need be ashamed of, at an explanation of a hitherto insoluble mystery. It does not seem in accord with the dignity of the universe it should have sprung from such small beginnings and be liable to be washed out by two ounces of sulphuric ether. *A priori* the universe must be something else, at least something more than our senses reveal to us. On the strength of the suggestion, made with a naïveté often characteristic of medical thought when it deals with matters supposed to be hull down on its horizon, a meeting was called by one of our medical societies to discuss consciousness from the basis of fat dissolvents. In this various university professors of psychology took part. What conclusion they arrived at, what was the fate of the lipin basis of consciousness, I never heard, but the man in the laboratory, when invited to participate, muttered something about not having time to play at the game of raising one's self by one's boot straps, and declined.

The testimony, wherever we turn, seems to intimate all originates in sense perception. We are creatures of our environment and of course the materialist seems secure to us in that assertion, and yet we see metaphysics as well as modern psychology, the science of sense perception it is now defined, is pretty well mixed up in the origin of knowledge. It is plain psychology cannot avoid metaphysics, except,

as Burtt says,* by keeping silent and that—will psychologists please forgive me?—they seem very far from doing at present. If they *will* talk about psychology intelligently they must acquaint themselves with what Plato and Aristotle had to say of it at the beginning of the recorded history of thought.

"These things," as Jowett translates it, "and others akin to these relating to true and waking reality of nature, we, having only the dream-like sense of them, are unable to arouse ourselves to describe or determine."† Taine was not right, as quoted by Faguet,‡ when he said: "I have no sight of the limits of the human mind, I see those of my own." He was correct as to the mind of humanity, but he was mistaken as to his own. No man knows how easily he can assimilate from his environment that which in another environment he would think highly absurd. He knows little of his own mind in any environment. The unconscious is part of it and no man knows what lies buried in his own. Suddenly and frequently he is astounded that his mind has limits far beyond what he supposed. Out of its depths come to light thoughts and even facts of which he has long been unconscious. Again it is Faguet who says: "A purely positivistic philosophy is making an appeal every instant to the unconscious, and if there is any one thing which defies cognition by definition it is the unconscious, and there stands a positivistic psychology, supporting itself on a metaphysical basis—we float upon metaphysics like a cork on the ocean."

If we insist that we exist we have to admit we have arrived at the conviction from the premises of sense, which we know often furnish an insecure basis, or else we have arrived at it in some mystic way we do not understand. We call life an epiphenomenon of inorganic matter, we declare consciousness an epiphenomenon of life, but these words are Greek to us; they mean literally nothing to us, and as we muse over the evolution of mind from that speck of protoplasm, to which I have referred, we might well call life and consciousness divine even as epiphenomena. It's a shorter word and can be just as meaningless, if we choose. We can read Plato in the light of the divine being the incomprehensibles, and thus cloaking our prejudices we can get more out of him than we otherwise would. He is constantly thus defining the divine.

Plato no more than Claude Bernard can avoid metaphysics in seeking to probe the depths of nature. The only difference is the

* Burtt, E. A., The Metaphysical Foundations of Modern Physical Science, Chicago, 1925.

† Timaios, 52, b, 6.

‡ Faguet, Émile, Pour qu'on lise Platon. Paris, Boivin et Cie.

latter turned aside and the former did not. "Fundamentally," said the latter, "I know nothing. Naturally. If I knew the basis of anything, I would know everything." The late Dr. Prudden once said to me: "We will never know the cause of cancer, until we know the cause of life." Even in biology, where materialism fiercely fights vitalism—with vastly more fanaticism than physics fights metaphysics—we rest on a basis of what the scientist calls, and often narrowly contemns, as mysticism. He denies spontaneous generation, so called, but he endows the germ plasm with mystic properties which no other substance on earth possesses. If, then, men who really deal with dead matter, like Lodge and Crookes, and men who search the inmost recesses of living matter all their lives, arrive at such conclusions as Bernard and Lodge and Wallace and Prudden, even though neither the first nor the last can be charged with being a vitalist, talk about a positivistic psychology is mere folly.

Plato plunges boldly from physics into metaphysics and when he approaches mind it is often almost solely from the mystical side—the dialectical side too frequently—and he not infrequently contradicts himself. "An image cannot exist in that of which it is an image without the two being one. Therefore, being two, it must exist elsewhere in space." Jowett translates the passage* in this sense, but Plato as well as Aristotle come to the conclusion, like modern relativists, that neither time nor space have any real existence, yet here he says that what is neither in heaven or earth has no existence, and elsewhere he ascribes to space six directions which we have cut down by using another word to three dimensions, when almost everything ceased to radiate from man as a center. Most of these apparent contradictions arise from the uncertainty whether the ancient philosophers are speaking in terms of sense conceptions or whether they are dealing with us purely in metaphysical terms, and there are difficulties too about the equivalence of terms in one language and another. Time God created for the convenience of man in the image of Eternity, but for Being, for Reality, there is no time, no night or day, none at least until God created it,† or, perhaps it is better to say, divided eternity into nights, days, months, and years. The revolving spheres which He placed in the heavens set the time for man. Just what "making time in the image of Eternity" is, it is difficult to understand. Eternity and other infinities, like the divine, are not graspable by the human mind. The human mind has to have a limit to things to form any definite concepts.

* Timaios, 52, b, 4.
† Timaios, 37, e.

Nevertheless we seem to get a less uncertain hold of the thought of Plato as to the Ideas. Aristotle called* the mind the image of images, but in this, if we are to use the usual translation, he is in contradiction with Plato, who quite plausibly says, as we have seen, that an image cannot contain that of which it is the image. Aristotle, however, totally rejects Plato's notion that matter was created in the forms or images of preëxisting ideas, but here in the *Timaeus,* as in his parable of the cave and the blazing fire within it in the seventh book of the *Republic,* he makes us understand by his wonderful art how sense perceptions are but the shadows of realities behind. This astounding feat of forcing on us a thought inconceivable in sense, burning it into the minds of all educated men who have come after him, so that they use his imagery constantly, unconscious of its source usually, is one of the wonders of intellectual achievement. "Coming events cast their shadows before," how utterly absurd on materialistic analysis. Not events but material things have a shadow —ah, there you are, real things have shadows, not so the concepts of sense, nor the abstractions either, but the forms (it is often better to speak of the Forms of Plato than of the Ideas). The Ideas are things outside the mind. They are the realities. It is the sense concepts we have *in* our minds, not the realities, and so in this sense, in the metaphysical sense the mind cannot be the image of images.

There may be error in this, but there is no nonsense. It needed the keen cutting analysis of Aristotle in the *Metaphysics,* I think chiefly, to point out the error, but as an hypothesis it is an entirely justifiable one. It means something. We claim, following the entering wedge of Aristotle as to the "common sense," that abstract ideas are syntheses of sense perceptions in the first place, but we have more to account for than that. What is it lies buried in the unconscious and comes back to our consciousness? How has it existed all these years? Where was its home? There is undoubtedly something real about a permanence like that. We can blind ourselves to the conscious everyday working of our minds being anything hard to understand—anything divine—but the storehouse door of the unconscious is shut in the face of the materialist. He gets no help from physics. Strike a ringing blow on cold steel and the unmarked steel bears the impress of the blow forever? It does not. Most of it passes away at once as motion or heat. Not so the mental impression. Aristotle denied the theory of ideas as the ultimate realities, but "as to the part of the soul with which he knows and understands," he says in

* De An., 432, a, 2.

Hicks' translation of the *De Anima,* ". . . we have to consider what is its distinctive character and how thinking comes about. Now if thinking is analogous to perceiving, it will consist of a thing acted upon by the object of thought or something of that kind . . . As the faculty of sense is to sensible objects, so must intellect be related to intelligible objects." In different language this is the thought of Plato. There is a material affinity, a keeping in touch by the spiritual world with the material. We lose the analogy to sense perceptions unless we consider the mind as receptive of intellectual impressions. I fancy it is in this sense, as hypothetical but not so foreign to our way of thinking as Plato's Ideas, Aristotle meant his descriptions of the mind as the image of images. There are two sets of images, one from sense and one in some way from the mind we can but conclude. The mind is receptive of both, and out of the two it manufactures "common sense." We see, therefore, that Aristotle, like Plato, keeps separate the origin of the two kinds of cerebration as they enter into combination, but Plato insists the intellectual element has its origin in Ideas; Aristotle says they both are the work of sense. As I understand him, one is the immediate translation of sense impression and the other impression is the memory of past experience and the former actions of the mind on it.

If this is correct, it is not far removed from our own conceptions, and here practically metaphysics first meets positivistic philosophy. We cannot see that Plato's view is very satisfying, for when we translate his divine origins, we recognize many of them as equivalent to our "I don't know." There are two kinds of knowledge for him, much more separable than Aristotle's, but in saying one belongs to Being and the other to Becoming the modern reader cannot fail to think the latter stage is continually merged into the former. One is divine and everlasting, the other sensual and evanescent. The one is knowledge, the other is opinion, but if the latter becomes the former or part of it, it is hard to see why Plato and Aristotle are not looking at the same thing from different angles. Aristotle urges that the divine can have no taint of matter about it, but Plato's theological view is practically pantheistic and monistic.

This is the impression one gets of the coincidence of Plato's thought and Aristotle's thought in regard to consciousness, that is to say, the affinity of this part of platonic thought with Aristotle's "common sense." I am leaving to one side the details of their account of the senses. Much the most part of Beare's book,* so

* Beare, John I., Greek Theories of Elementary Cognition. Clarendon Press, 1906.

widely and so favorably known, is taken up with this. Medical historians also have less successfully summarized what is possible from classical records, but Beare has done it in an admirable way. He says the synthesis of the senses, the "common sense" of Aristotle, is the most interesting part of his theme. It is for our purpose here not only the most interesting part of the *De Anima** and of the *Metaphysics,* but it is for us also in the discussion by Beare the most important. However, I have made little use of it, since possibly my own gross errors are more interesting than a repetition of his accurate and greatly extended account which is accessible to all. The reaction of a very fallible modern man to Aristotelian logic is more interesting when it is not influenced by translations and comments from another man's mind. This matter of consciousness, Beare shows pretty conclusively, Plato, in a terminology differing from our own, was the first to take up. Alcmaeon held the view that the abolition of consciousness in sleep was due to the recession of blood into the larger vessels, and in this he was followed by Aristotle, in conformity to his preference in regarding the blood as its chief seat. Empedocles and Democritus scarcely touched upon it, but in Anaxagoras we get the herald of the platonic thought, since the older philosopher, with whom Socrates is represented as having acquaintance through his writings at least, held that mind or rather the more extended conception of it in his *nous* was the origin of it, pure and simple. We can translate it God as a short cut, this *nous* of his. Diogenes brought it somewhat nearer to earth by associating it with the air in and around the brain which communicated with that in and around the heart.

Plato does not mention "common sense," but as I have attempted to show, "he investigated carefully the function of synthesis whose importance was paramount in his psychology."† In the *Theaetetus* Plato takes the view so often epitomized, that we do not see with the eyes or hear with the ears, but through them. We perceive with the help of something in common with the senses. Imagination, a part of this something else, presents the image. The mind perceives the image and memory retains it. It is we who recognize that the memory preserves it in unconsciousness, when it is forgotten by the mind, but frankly do we not wander thus as far into mysticism as Plato does in deriving that something else from Divinity?

Now, naturally, we may ask, having in view what we know and for the moment forgetting how much we don't know, something more

* 418–427.
† Beare, p. 260.

about the evolution of sense organs. Whence do the senses arise? The sense organs are anatomical objects and we have referred in the briefest way to their evolutionary origin, but it is some sort of a physiological answer we now want. Aristotle* perceived without any of our knowledge that the sense of touch is the primordial sense—in close affinity with the irritability of protoplasm as we see it demonstrated in the living amoeba under the microscope at the impact of a particle of dust or the glass needle point of the experimentalist. Our imagination, chiefly, presents us with the picture of the impact of corpuscles on the dark speck of protoplasm which in the course of evolution has become the retina of the eye—*voilá,* the sensation of sight. What a jump! My own imagination carries me no further but it is stirred on finding Aristotle twenty-five hundred years ago on the scent of the origin of the senses in the irritability of protoplasm—a touch. "Without touch an animal can have no sense." With it Helen Keller has taught us how it takes the place of organs more easily destroyed which have evolved from it.

Reducing, then, the senses to their simplest terms, we come into contact with objects of sense through the irritability of protoplasm, once just a mere speck on a cell growing into vision which Plato as well as we recognize as the highest and best gift of God—and the most fragile. We survey the universe from this most minute origin. Aristotle seems sure sound would exist if no living things had ears.† Some, with me, will not be sure of that, for we have listened to the teaching of Alcmaeon or something similar—that sound is produced by the incidence of waves of air on the ear drum. Alcmaeon lived only two hundred years, or very likely less, before Aristotle. Our meteorologists and astronomers tell us that perhaps not more than fifty miles up the air thins out to nothing. Plato and Aristotle listened too attentively for the Pythagorean music of the spheres; they missed Alcmaeon's little remark or its significance. Perhaps there are reasons why we should not be too hasty about it, but on reflections such as these we feel inclined to cast ourselves in the camp of Plato and conclude as we gaze on the waving foliage there would be no foliage if there were no eyes, but we shrink from outraging sense in that way and content ourselves with the vague innuendo of Calderon which commits us ostentatiously to nothing, *"la vida es sueña."*

Opinion wavers when man thinks alone, by himself in the solitude of his study, or in the long stretches of the night, but when he is out

* De An., 425, a, 14; 435, a, 11.
† De An., 425, b, 25, seq.

in the swaying crowd of scientists on the street, he is firmly of their opinion. Knowledge and even true opinion, which the scientists on the sidewalks sometimes admit they do not always hold, are two different things, and I have attempted above to dwell a little on the reasons for the view of Plato and the consequences flowing from it. Plato* says mind and opinion are two things of different origins, and if that is so those ideas unperceived by sense must exist in reality. It is true this makes a dual organ of the brain—that which connects man with earth and that which connects man with God. Leaving aside the mystic part of it, I am not sure some modern psychologists will not be disposed to agree with this corollary. It is a perceiving soul and a rational soul. I drop into the permissible rendering of mind in the Greek sense to recall to my readers we are very familiar indeed with the multiple souls of primitive men in the tales of the ethnologists, and some of us may have heard of Plato's tripartite soul. All this subdivision arises from the need felt by primitive men, as well as by the most evolved intellect the world has ever known, to shift burdens too diverse in composition for one carrier to bear to more souls than one. We as materialists refuse to see any evidence of this, but we do have to admit we have always been acquainted with the brain as a multilobar organ like the liver. There are two eyes and there are two cerebral hemispheres, and both the eyes and the hemispheres have their chiasms of nervous matter. Unlike the liver, or only like it in a feeble degree, we have innumerable localizations of mental functions being constantly brought to our attention by the experimentalist and clinician alike. It is a very complex organ, we admit, but if we are not ready to admit that its function is anything more than that of secreting thought as the liver secretes bile—than digesting the pabulum brought to it by the nerves of sense—we are driven to the conclusion of Aristotle in declaring the mind is the image of images. At the higher levels of intelligence it manufactures its own images. Plato says no image can contain its own image, and we still refuse to believe in spontaneous generation. We demand some external stimulus even for parthenogenesis. Aristotle believed in spontaneous generation. Why should not the mind generate its own images? Plato says they flow into the mind by the providence of God, who has in the mind of man established a radio station which gathers in His messages. Aristotle had to invent his entelechy to transmit such messages, and we gain nothing in trying to prove this was not as mystical as Plato's Receptacle in the *Timaeus*. Mate-

* Timaios, 51, d, 3.

rialism gains no support from Aristotle. His mysticism is different, but for us it is as mystical as Plato's.

Now in the subconscious or the unconsciousness of every man there exist forgotten memories, if I may speak *á l'Irlandaise.* They are sense impressions registered in the brain sometimes without even calling consciousness' attention to it. This may be banal or it may be wrong—I am but a novice—but I imagine that is the form of explanation most common among modern psychologists. I should suppose from what I hear the recent graduate say, this is the common parlance of the lecture room. What is meant by impressions registered? Impressions in putty? Finger prints? Scratches on stone or pressed into bronze? Brain pressure doesn't work in that way. It is Plato's flowing electrons from the Infinite Mind.

One tribe of the mystics has said that these phenomena of the subconscious have their origin in memories of a previous existence of the soul incorporated in a life once otherwise lodged. They are the modern Pythagoreans with oriental antecedents. We as materialists may not be indisposed to say with Aristotle that the mind manufactures its own dreams, its own subconscious phenomena. We are dubious, even going thus far, if we have cleared our skirts of mysticism, but when we talk about impressions memory records in the subconscious, like the ostrich hiding his head in the sand and like an elephant dancing a hornpipe, we are trying to hide our mysticisms in a symphony of materialistic terminology quite unsuited to it and we dance to the tune with all the grace of a pachyderm. Psychology has always been in contact with this incongruity. It has always had mysticism as its background, but now physics seem to have gotten into like difficulties. Plato's *One* (and no other) *Being* and *Becoming,* Aristotle's *Unmoved Mover,* the modern mind boggles at and calls metaphysical, but action at a distance through a void or an unearthly ether with impossible attributes, a vacuum filled with gravitation as its function, modern physics asks us to accept, one or the other or all, while science, looking at a star, says all its matter has been resolved into energy—something moving—nothing to be moved. We scarcely blink as we pass from positivism into what we yesterday called mysticism. Time and Space are disappearing, but Eternity and Infinity are looming up. Alas for the human mind. *Que sçais-je?*

A COMPARATIVE STUDY OF VARIOUS METHODS OF THE ADMINISTRATION OF LUMINAL IN EPILEPSY*

By Harold A. Patterson, M.D., F.A.C.P., Le Grand A. Damon, M.D., and Paul Levi, M.D.

RESIDENT PATHOLOGIST, SENIOR ASSISTANT PHYSICIAN AND ASSISTANT PHYSICIAN, RESPECTIVELY, CRAIG COLONY, SONYEA, NEW YORK

Much can be found in the literature relating to the oral administration of luminal but a very little in regard to its administration by other means. In order to gain further information as to the therapeutic effects obtained and the relative value of various methods by which the drug may be given, a comparative study was undertaken of the results secured by the oral, subcutaneous, intravenous and intraspinal methods of treatment. For this purpose a series of four groups of selected cases was chosen from among the inmates of Craig Colony.

The group in which luminal was given by mouth is by far the largest one in the series and the observations on this group were extended over the longest interval of time, since it includes approximately 300 patients, who were given the drug during a period of from 1 to 4 years' duration. In these cases the phenolbarbital was given as follows: A 1½ gr. tablet was taken each evening at nine o'clock. In a few instances it was found necessary to supplement this treatment with an additional tablet upon the patient's arising in the morning. This, however, was necessary only when the diurnal attacks predominated. No changes were made in the routine life or general colony treatment of those selected. Their diets, occupations and recreations were not changed in any way during the time of the investigation. None of the cases received any other form of routine medicinal treatment while taking luminal. Because of the fact that the dosage was kept at a minimum, practically all the untoward effects noted by other observers failed to develop, although a rash appeared in a very few instances, as is subsequently indicated. No gastrointestinal disturbances manifested themselves and, aside from the fact that a few patients complained of feeling drowsy in the morning, no untoward effects were noted. Later, during the course of the observation, it was learned that this drowsiness could

* Read before the 24th Annual Meeting of the National Association for the Study of Epilepsy, at Richmond, Va.

be eliminated by giving the tablet at an earlier hour on the preceding evening.

The primary purpose of administration, the attempt to lessen the number of attacks, was accomplished to the extent of a reduction of 45 per cent of the total number of seizures previously averaged. This percentage is not as high as that reported by Greenwald of the New Jersey State Village for Epileptics, who had a reduction of approximately 64 per cent of seizures in 105 cases treated; nor that of Watkins who reports a reduction of 66 per cent in seizures or of Kirk who obtained a reduction of 79 per cent, the highest reported in the literature.

At the beginning of the experiment it was thought that perhaps a larger dosage might give an even higher percentage of favorable results but no greater benefit was noted in several cases in which the dose was doubled and in some instances even tripled.

It has become quite generally established that luminal has a more favorable influence on severe than mild attacks and this observation has been borne out by the results obtained in this series. The severe attacks were found to be reduced 60 per cent while the mild ones were diminished only to the extent of 22 per cent. As an explanation for the apparently feebler effect upon petit mal seizures, one of the writers (Lad) has offered the suggestion, in a previous paper, that the action of luminal is chiefly upon the motor centers and would, therefore, be more efficient in attacks in which the motor element was predominant, *i.e.,* in grand mal attacks.

In fact, it was frequently observed that a patient who was subject only to the grand mal type of seizures, under luminal therapy would have merely petit mal attacks. Broadly speaking, the motor element had apparently been eliminated. In this connection the well known action of luminal in other nervous affections where there are motor disturbances may be noted in passing. Chorea usually responds readily and the various tics are benefited while myoclonia is most favorably influenced.

In these 300 cases, which consisted of about an equal number of both males and females, very little difference in beneficial effect was noted in the two sexes.

Of secondary interest, but nevertheless important, are the effects on general behavior. Dull, surly, irritable epileptics frequently became more cheerful and coöperative. Altercations among the patients lessened and the attendants reported that the luminal cases were much easier to handle than previously. In some instances effects of this nature were the only changes noted. In these cases

the patient continued to have his usual number of seizures but his marked mental improvement seemed to warrant a continuation of the drug. Almost invariably the heads of the departments in which these patients were employed, commented upon their greater efficiency and willingness to work.

In individuals where deterioration had already begun to manifest itself, the process was in some instances checked or retarded, while in others of this type very little influence was seen. The results secured in this connection seem to parallel those obtained in relation to seizures; *i.e.*, the deterioration was checked in those cases where the number of seizures was likewise checked or retarded, whereas the deterioration appeared unaffected in those instances where the number of seizures continued unaltered.

Inasmuch as this experiment was continued over a relatively long period of time, some idea of the cumulative effects of the drug may be derived from the following table of seizure frequencies:

Case	Case No.	1919	1920	1921	1922	1923	1924
AA	4326	20	14	5	3	2	1
FA	4488	29	40	0	0	0	0
WA		17	19	8	10	2	4
AB	4037	28	23	3	5	3	4
FF	4180	27	47	17	6	6	7
MH	1886	4	9	4	5	1	0
HK	3193	10	18	6	7	5	0
JM	242	25	12	4	4	13	10
AW	1645	42	50	18	10	9	2
Total.....		202	232	65	50	41	28

Case	Case No.	1920	1921	1922	1923	1924
AD	2066	34	55	24	12	14
JG		45	40	21	20	15
WH	5451	40	31	16	4	8
AH	3695	115	118	58	49	44
GH	4444	52	40	11	4	9
SJ	4845	81	73	66	69	29
VM	1145	133	90	33	38	44
WI	1896	47	45	18	15	14
AN		36	38	8	5	1
IP	5159	38	37	10	9	7
WS		394	280	113	131	77
LS	4901	35	19	9	13	0
CW	487	53	54	37	30	26
Total.....		1103	920	424	399	288

Case	Case No.	1921	1922	1923	1924
LA	2742	87	75	1	0
LS	5738	15	13	3	2
WS	4831	19	22	1	0
JS	5562	88	89	39	40
Total.....		209	199	44	42

From the above table it will be seen that, instead of an acquired tolerance, as one might expect, there developed a progressively diminishing capacity for the drug.

Untoward symptoms attend the cessation of this treatment. In the earlier days of luminal therapy, some rather unfavorable effects were experienced by the writers through its sudden withdrawal. These were quite similar to those produced by an immediate cutting off of the bromides and consisted of serial seizures together with some instances of status epilepticus. In cases, therefore, where it becomes necessary to discontinue luminal, because of the deleterious results obtained, the same precautions should be taken as with the bromides, namely: a gradual reduction of the dosage. On the other hand, even though some patients had been seizure-free for 3 or 4 years, an attempt to discontinue the drug proved ill-advised in view of the fact that upon its withdrawal in cases of this kind, there followed an immediate resumption of attacks.

The results obtained in these 300 cases indicate that luminal should not be regarded as a curative agent in the treatment of the epilepsies but rather as a palliative measure in the treatment of convulsive disorders and should by no means supplant attention to general hygienic measures, improvement in the patient's general physical condition and regular habits and other medicinal treatments as indicated.

The second method employed was that of subcutaneous (hypodermatic) injection of luminal sodium. The latter was used in place of the luminal given orally because of its greater solubility and the possibility of obtaining solutions of high concentration. For instance, five grains of luminal sodium are readily soluble in 1 c.c. of sterile water and can be given with the ordinary hypodermic syringe. This salt of luminal has a milder action than luminal itself, so that it requires a little more than three times as much of the former by weight to produce an equivalent therapeutic result. The dose, therefore, usually ranges from 5 to 15 grains, depending upon the purpose for which it is employed.

For obvious reasons, this method of administration hardly lends itself to routine treatment and, consequently, has been used only in instances of serial seizures and status epilepticus, where oral administration was difficult or impossible and a more rapid therapeutic action was needed. About 50 per cent of all cases of serial seizures so treated responded favorably. Less satisfactory were the results obtained in status epilepticus, where a much smaller percentage of individuals showed apparent benefit. This may be

attributed to the rather slow absorption which occurs under these conditions and failure of the drug to reach the central nervous system in sufficient concentration to bring about an immediate response. Here the seriousness of the condition demands the use of chloroform or some other agent of a similar nature producing a more prompt relaxation.

No reactionary symptoms were noted in cases treated in this way, even where a dose as high as thirty grains was given in a comparatively short interval. The effect produced was of from four to five hours duration and the dose rarely needed repetition. Where this method of administration can be employed more or less extensively, as in an institution, the physician soon learns to distinguish two groups in one of which the members respond readily to subcutaneous injection while in the other treatment with luminal sodium produces no effect and recourse must be taken to the other usual methods of sedation.

The third method of treatment is the intravenous method, of which, so far as can be ascertained, no previous use has been reported. This method is, therefore, thought by the writers to be original with them. Consequently, it was with some misgivings that this phase of the investigation was undertaken. As a preliminary consideration, a solution of luminal sodium in physiological saline was found by experiment to be nonhemolytic. Seventeen cases were studied. All of them were chosen because of the occurrence of almost daily attacks in each individual. Injections were made into the median basilic vein with the usual technique.

The technique for the preparation of the solution of luminal sodium, suitable for intravenous use is simple. A sterile flask was filled with 50 c.c. of physiological saline solution, stoppered with a compress rather than a cotton plug—in order to prevent the entrance of cotton fibers into the solution during the heating process, since these would be a source of potential danger if injected into the vein—and heated over a water bath for half an hour. After or during cooling, 50 grains of luminal sodium were added and the flask violently shaken in order to insure a uniform distribution of the solute throughout the solvent because, otherwise, there would have been a greater concentration of the drug in the lower levels of the fluid. A solution thus prepared will keep for a short time and may be used for both intravenous and intraspinous treatment.

In the intravenous method, the initial dose was two grains and this was progressively increased at two-day intervals by one grain at each succeeding injection until a maximum of five grains was

reached. For this purpose, the stock solution above described was used. For the first dose, 2 c.c. of this solution were drawn into a 5 c.c., all-glass syringe, which was then filled to the 5 c.c. mark with sterile, physiological saline solution. At each succeeding injection the amount of stock solution was increased by 1 c.c. and the saline used decreased by the same amount until the maximum of 5 c.c. was reached, when no additional saline was required.

At the beginning of the study, the patients receiving the injections were kept in bed under close observation and pulse, temperature, respiration, etc., were noted, but as the investigation proceeded these measures were found unnecessary and were abandoned since the behavior of the individuals under observation was not in any way remarkable. Over 100 intravenous injections of luminal sodium have been given in the course of this study and in no instance were any deleterious effects manifest. Included in these 17 cases were five cases which had previously failed to respond to oral administration. Only one of these showed any greater response to the intravenous method.

Since the primary purpose of this phase of the investigation was to establish the feasibility of the intravenous method of treatment, it is difficult to evaluate the results obtained. After its possibilities had been satisfactorily demonstrated, this method was used on three cases of status with very striking results. Convulsions ceased almost as soon as the drug was introduced into the vein. Opportunity for further observation has not as yet presented itself as this study has been in progress for only a relatively short time.

The advantage of the intravenous method of medication lies in the direct introduction of the drug into the blood stream in sufficiently high concentration to produce an immediate effect, thus eliminating the time required for absorption. Naturally, a smaller dose is required to produce the same result than with either of the two methods previously described.

The fourth method employed was the injection of luminal sodium into the spinal canal. This method is also believed to be original with the writers. Altogether 50 cases were treated in this way. Those selected for the experiment were chosen from the various groups of the epilepsies and were of equal sex distribution. They included a few patients having only occasional seizures.

The chemical and physical examination of the spinal fluid, which was carried on synchronously with this experiment, made it necessary to remove different amounts of the fluid prior to the injection of the drug. The quantity withdrawn varied from 1 to 30 c.c. In

the subsequent injections the stock solution of luminal previously described was used. The patients were placed in a sitting posture in a specially designed chair. A local anesthetic of ethyl chloride or novocain in a 1 per cent solution was used. After removing the spinal fluid by the ordinary technique of spinal tap at the level of the fourth or fifth lumbar vertebra, a record syringe having a shank to which the spinal fluid needle could be securely adjusted, was partially filled with the desired dose of the stock solution of luminal sodium which was then diluted to 10 c.c. with normal saline and the whole amount was introduced very slowly into the spinal canal. At the beginning of the experiment 1 grain was injected; later on this was gradually increased to 5 or 6 grains. The number of injections in each case varied from one to thirty. The patients were kept in bed under hospital observation.

In considering the effects it is necessary to distinguish between that due to the injection and those of the puncture per se. Some of the latter were pain and cramps in the lower extremities soon after treatment. These were undoubtedly due to trauma of the cauda equina at the point of tap. There was a marked difference in this regard between the two sexes, as the females complained quite frequently of severe headache—especially the first and second day after the puncture.

The optimal therapeutic dose was apparently much lower in the females than in the males, ranging from one to two grains in the former while the latter reacted best to doses of between three and four grains, and several of them stood 6 grains without complaining of any subjective symptoms. From previous experiences it seems probable that these complaints of headache were only sequelae of the tap itself and of the consequent leakage of the spinal fluid into the subdural space.

A rise in temperature often appeared with this type of treatment. The records show that following the injection the temperature rose in many cases as high as 101° F. and in one case even up to 103° F. The highest temperature was usually seen about 10 hours after the injection, *i.e.*, the evening temperature of the patients tapped in the morning of the same day was the highest. Except in those individuals where incidental disease, such as tuberculosis kept it high, the temperature in all these cases dropped in about two days. This rise in temperature, the writers believe, was due to the injection. Because a chemical analysis of the spinal fluid was being carried on along with this experiment it was necessary in 10 cases to inject intramuscularly a solution of potassium iodide, 12 hours prior to

the tap. The omission of this KI injection had no influence on the temperature after the luminal injection. Furthermore, mere spinal drainage without the injection of luminal was not followed by a remarkable temperature.

It is interesting to note that for the first half hour after treatment there were no subjective or objective manifestations; even seizures were observed during this interval.: After this transition period, however, the patients reacted quite differently. Some who had just previously had a large number of severe seizures and who started the treatment in a stage of exhaustion, both physically and mentally, did not, as one might expect, show an increase of their exhaustion symptoms but, on the contrary, seemed stimulated rather than depressed by the effect of the drug. Shortly after the injection they were more interested in their surroundings, became talkative and more active. In the majority of cases, however, the effect was a sedative one. The patients became somnolent for several hours and had no seizures for about a one-day interval. During this time responses to external stimuli were diminished. The duration of this period varied; in some cases, especially those having petit mal, it was necessary to repeat the injections every day in order to control the seizures, while in others taps were required only at two- or three-day intervals. In this connection it may be remarked that in one instance as many as thirty punctures, with the removal of from 10 to 25 c.c. of fluid prior to the introduction of luminal, were performed with only beneficial effects following.

It was noted that those patients requiring a high subcutaneous dose also needed a proportionately large amount of the drug by the intraspinous method. The behavior of luminal sodium given intraspinously in relation to the development of tolerance is similar to the action already noted in the preceding methods, *i.e.*, after the optimal therapeutic dose has been determined for a given individual, it is not necessary to increase that dose.

Cases in which the therapeutic dose was exceeded showed in the fluid on a following tap all the findings of a typical meningitis, *i.e.*, increased pressure, higher amount of albumin, a marked globulin reaction, low sugar content, and, especially, a very high cell count, which sometimes rose as high as 6,000. The increase was chiefly of the degenerated leukocyte type. Cultures of the fluid were all negative. This objective reaction was accompanied by no subjective symptoms in the males, although complaints of general discomfort, such as headaches, backaches, etc., were increased in the females.

Subsequently the cell count showed a decrease reaching a normal level in about five days.

In two of the fifty cases the nurse on duty observed the appearance, about fifteen minutes after injection, of an extremely transitory rash, urticarial in character, of about ten minutes' duration, which tended to recur at intervals for about six hours.

The use of this method has not proven satisfactory in serial seizures or status epilepticus, where it is contraindicated because of its relatively slow action and because of the fact that an aseptic meningitis may perhaps be developed, thus adding further insult to the already congested and edematous condition of the meninges. The fact that it usually requires at least a half hour after the introduction of luminal into the cord for effects to appear suggests that this drug does not act by a direct contact of the solution with any center in immediate connection with the ventricular system, but probably by absorption into the blood stream.

Special benefit followed the administration of luminal by this method in one case where no therapeutic action had been observed while the drug was given by mouth prior to the puncture. This patient responded at once to intraspinous luminal therapy, which was extended over a period of about three months, after which time he reacted to luminal sodium subcutaneously and to luminal by mouth, apparently being much benefited by the latter. The results thus far obtained leave this method in the experimental stage. It seems to be indicated in the hope of stimulating a response to some of the other methods of administration, in those refractory cases where luminal has been unsuccessfully given by these other methods, as in the case just cited.

In considering the relative values of the four methods described it may be said that the oral method of treatment, where it gives satisfactory results, is preferable, because of the fact that it may be continued over long periods of time, since it can be given with very little inconvenience and practically no danger to the patient. The method is simple, requires no special apparatus, and can be carried out by the nurse or attendant or in some cases even by the patient himself. In cases of serial seizures, however, oral administration becomes difficult, if not impossible, because of the patient's unconscious condition. Here, however, a comparatively more rapid therapeutic effect is needed. In such cases luminal sodium, given hypodermically, has frequently, in the writers' experience, met these requirements very satisfactorily. The need for a more rapid therapeutic action is even greater in cases of status where the intravenous method is, therefore,

recommended. Finally, in those individuals where all preceding methods of administration have failed, resort may be had to the intraspinous method in an effort to stimulate a subsequent response to the drug by some more convenient method of administration.

The results obtained in this investigation have led the writers to the following conclusions:

1. Luminal may be given orally, subcutaneously, intravenously, or intraspinously.

2. No ill effects have followed the administration of therapeutic doses of this drug by any of these methods.

3. No tolerance is developed for phenolbarbital by any of the forms of treatment used.

4. The effect of luminal in epilepsy is palliative rather than curative.

5. Sudden withdrawal of the drug is contraindicated.

6. Luminal treatment by any of the four methods mentioned apparently has more influence upon severe than mild attacks.

7. The period required for the appearance of therapeutic effects is as follows: Orally, 1–2 hours; subcutaneously, 15–30 minutes; intravenously, almost immediately; intraspinously, ½ hour or more.

8. The subcutaneous method of administration is preferable in serial seizures.

9. The employment of the intravenous method is indicated in status epilepticus.

10. Intraspinous injection may subsequently render refractory cases more amenable to other types of treatment.

BIBLIOGRAPHY

Damon and Doolittle. Luminal Therapy in Epilepsy. State Hospital Quarterly, 1925.

Greenwald. The Use of Luminal in Epilepsy. New York, M. J. (etc.), 1922, CXVI, p. 356.

Kirk, C. C. Analysis of more than 200 cases of Epilepsy treated with Luminal. Am. Jour. of Insanity, 77:559, April, 1921.

Watkins, H. M. Epilepsy Treated With Luminal. Preliminary report of 22 cases. N. Y. Med. Jour., Vol. 112:891, Dec. 4, 1920.

Williamson. A Chair for Spinal Puncture. J. A. M. A., 74:602 (Feb. 28), 1920.

VAGOTONIA AND HYPOGLYCEMIC REACTIONS*

Seventeen Cases

By Johannes M. Nielsen, M.D.

of Battle Creek, Michigan

In Eppinger and Hess' epoch-making monograph (1) in 1915 an increased carbohydrate tolerance was stated to be one of the characteristics of the vegetative nervous system imbalance which they named vagotonia. Attention was called also to the chronic hypoglycemia occurring in Addison's disease in which a marked vagotonia occurs due to lack of sympathetic stimulation.

Seale Harris (2) first described the frequent findings of hypoglycemic reactions in patients who had never received insulin. He termed this hyperinsulinism because of its similarity to or identity with the reactions seen in patients following overdosage with insulin. He found that overwork was a frequent cause of "hyperinsulinism."

The present writer has been impressed with the frequent occurrence of vagotonia in a certain class of patients—those who have reached middle life after years of strenuous work And in making a study of these cases the occurrence of hypoglycemic reactions ("hyperinsulinism") was found to be remarkably constant. It was also found that in the absence of chronic overwork, chronic infection or repeated acute infections resulted in the same syndrome, that vagotonia may alternate with sympathicotonia in one individual, and that both may occur unassociated with any psychoneurosis.

A series of seventeen consecutive cases of generalized vagotonia is presented. In the first case a complete report is given, while in the remainder the cases are only tabulated.

Case 1. G. H. R., male, aged forty-two, married, without children, dean in a university. His friends know him as a man having an unusual capacity for work. He has used all his spare time for study and advancement while working daily and has continued to do this for years. He comes complaining of frequent colds that incapacitate him for work, either mental or physical.

During the past ten years he has experienced a gradual diminution in his capacity for work and has had many attacks of acute illness. In 1918 he had diphtheria which was undiagnosed for eight or ten days. No paralysis occurred

* From the Neurological Clinic of the Battle Creek Sanitarium.

or sequelae remained. In 1919 he had influenza and was confined to bed for six weeks. For a few hours only his mind was not entirely clear. The gastro-intestinal tract apparently suffered the most. In 1920 he had another attack of influenza. In 1921 he was confined to bed for four months with a bad cold in the head and throat. He then had tonsillectomy which improved the condition somewhat. In July, 1922, he had a submucous resection with drainage of the ethmoid sinuses. In April, 1923, he had another cold and was unable to work for nine months. In June, 1923, he had another operation for drainage of sinuses. He then went southwest to the desert where he improved so far as the sinusitis was concerned. Then he had an operation for anal fistula. In February, 1924, he went to work and worked until September when he had influenza again and has been unable to work since that time.

Prior to 1922 the circumference of his neck had been increasing (without general increase in weight of the body) for six to eight years until he had difficulty in obtaining a collar sufficiently large (18½). By 1924 he wore size 17. There was no general loss in weight with this diminution in circumference. He now wears a collar size 16 to 16½. He has lost fifty pounds during the last year.

Physical examination made on entrance (July, 1925) revealed a well nourished man who appeared to be about as old as he stated, but seemed weary. His hair was dry. Blood pressure was 122 systolic and 78 diastolic. Pulse was 96. Skin was soft and wet with perspiration. Sense of smell was absent. Conjunctivae were injected. Tongue was badly fissured and coated. There was a fine tremor in hands when extended. Patient walked with a weak careful gait. There were no other findings obtained worthy of mention.

Laboratory findings revealed that patient excreted at least 4,000 c.c. of urine in 24 hours, with low specific gravity but normal total solids. The acidity was $_{p}H = 5.3$. Ammonia content was above normal but no other pathological findings were present. The blood examination showed: 84 per cent hemoglobin, a lymphocytosis of 37 per cent, all other constituents normal, including blood chemistry. Wassermann test on the blood was negative. The bowel condition was badly putrefactive. Alveolar CO_2 tension was 45. Fluoroscopic examination of the chest was negative.

The detailed history proved difficult to obtain, because in volunteering information, the patient attempted to distinguish between the relevant and irrelevant. He was a close observer, but feared to bore the listener with details. The complete history was obtained only after two months of daily consultations. History and findings summarized, are as follows:

The disturbances are very definitely cyclic, consisting of two chief and antagonistic phases and one accessory phase. These may be called vagotonia, sympathicotonia and X.

Vagotonia begins with a bloating in the abdomen, salivation, and extreme hunger. Marked mental fatigue then ensues and sometimes a depression as well. A mask-like expression of the face has been noted. He becomes physically so weak that he is compelled to go to bed. This weakness is peculiar in that he does not feel exhausted or even tired and does not feel as though he is resting when reclining. He is merely weak and the weakness may be so severe that it amounts to a paralysis. His power of concentration under these conditions is still normal but he feels in his head a sense of fatigue and depression amounting to a stupor. This is not a headache. The use of

the eyes such as reading brings on this feeling in his head much more rapidly than does mental concentration when the eyes are not used.

A discharge from the nose now begins, the sinuses feel congested, the eyelids are a little swollen. Pupils are small; he has an accommodation spasm.

The pulse is slow (60–65), temperature 96–97, blood pressure is about 90 systolic and 60 diastolic. There is a pulsus irregularis respiratorius and a pulsation in the head bothers him. There is tinnitus in the ear on which he sleeps. Salivation is marked and is brought on by patient's lying on the right side. (This is a recent development.) Yet his throat is dry at night. Pharyngeal reflex is practically absent.

He suffers from insomnia, waking often, and feels sleepy and groggy in the daytime. There is a hypermotility of the stomach and hunger before meals. Mucus appears in the stools and the color of the stool is lighter than in the other phases. He feels better at times when the stools are darker if variation occurs. He thinks that prolonged concentration of attention causes gas to accumulate in the bowels after the next meal. The constipation which is always present is much relieved.

Hands and feet are cold and clammy. There is an excess of perspiration. He sweats all over the body except the head. The calves of the legs sweat most and the legs are the last to cease sweating when this disappears. Sodium bicarbonate by mouth, slight physical exertion, or eating, as well as bowel activity, slow up the perspiration. Mental effort increases it. The patient sweats far more on the part of the body that is uppermost, whether it be a knee, a leg or one side of the body.

There is frequency of urination and enormous quantities are excreted. The patient voids a quart or more at a time. He suffers from urticaria, the skin is sensitive to the touch; it hurts him to shave and the skin remains red after shaving. The legs become red when the patient rises from a reclining posture. There is a fibrillary twitching of the muscles of the lower extremities, especially when patient retires. Jerking of entire groups of muscles is common.

This phase begins about every four weeks and lasts about two weeks spontaneously, but is easily brought on by physical overexertion, exercise of the sexual function, or by permitting constipation.

After a period of vagotonia, which may last a week or may last for months if untreated, the patient gradually recovers and then passes into a state of relative well-being. In this phase (sympathicotonia) there is at the onset an increase of mental fatigue which had improved toward the end of the vagotonia. This fatigue is much less marked than in the other phase however.

He is now much stronger, has greater endurance but still cannot walk more than three city blocks without falling back into vagotonia. Headache is relieved, he can use his eyes better, the feeling of a cold in the head disappears, sinuses are not congested, there is no nasal discharge, pupils are larger than before, accommodation spasm disappears, the pulse is normal or rapid but regular, temperature is normal, salivation disappears, he sleeps better, stools are darker, perspiration ceases, constipation is worse and urination is somewhat reduced.

There is a definite gastric stasis, constipation continues to increase, patient takes effervescent magnesium sulphate daily or every other day. Adrenalin dropped into the eyes produces mydriasis. One-half c.c. of one to one thousand adrenalin injected intramuscularly produces severe tremor and excitement last-

ing several hours. Pilocarpine injected produces no effect except a slight feeling of warmth. Careful attention to bowels and avoidance of exertion aid in keeping the patient in this phase.

The third, or accessory phase (phase X) occurs at the beginning of a vagotonia if it occurs at all in the cycle. Its occurrence is not essential. Its duration is always one week. There is a rise of temperature, a definite congestion in the eyes and nasal passages and a "cold in the bowels." The pulse is rapid, he has great difficulty in sleeping, even more than in vagotonia. In this phase there is a definite infection of the nose and throat with a purulent discharge.

In addition to symptoms which so definitely fall into groups there are other important findings, the grouping of which is not absolutely determined in each case.

In the sympathicotonic phase the basal metabolism is —16. A barium meal shows no evidence of spasticity but does show evidence of a pathological gall bladder. Graham test shows the gall bladder filling normally but not emptying in the time limit considered normal. The glucose tolerance test shows the following:

100 grams of glucose given.

At time given—	½ hr.	1 hr.	2 hr.	3 hr.	4 hr.	
Blood sugar....	62	167	152	91	71	77 mg. per 100 c.c. of blood
Urinary sugar..	22	19	51	121	95	29 mg. per hour

When the three-hour specimen was taken the patient suffered from weakness, sweating, hunger, and marked fatigue. He did not recover for several days. The normal urine figure should not be above 50. There is a renal glycuresis.

Gastric analysis shows normal acidity (done in the sympathicotonic phase):

Time	res.	½ hr.	1 hr.	1½ hr.	2 hr.	2½ hr.
Total acid.....	60	32	52	56	78	50
Free HCl.....	48	0	12	30	44	20

Findings which do not vary with the phase, or which have not been grouped at all according to phase, are as follows:

He is sensitive to the following by skin test: beans, rice, mutton, carrots, radishes, black pepper, pork, sea foods, strawberries, grapes, peaches, raspberries.

Although not sensitive, he is also unable because of resulting bowel discomfort to eat the following: potatoes, spinach, tomatoes, turnips, apples, apricots, grape-fruit, oranges, pineapples, plums, rhubarb, cocoa, coffee, tea, egg yolks. Milk is his best food.

X-ray of his head is negative in every way. Fundus examination reveals evidence of an old exudate, so located as to affect the vision and also shows slight weakness of both external recti muscles. Differential blood count shows Polym. Neutr. 60.5 per cent, Eosino, .5 per cent, Basophil .5 per cent, Transitionals 1.5 per cent and small Lymphocytes 37 per cent. Patient also has a rectal ulcer.

The patient is very definitely benefited by thyroid substance, general exposure to ultra-violet light daily, tonic hydrotherapy, basic diet with alkali, parathyroid substance and calcium, ox-bile tablets, fruit between meals and yeast, probably rated in the order named. He has been seen daily for five months. His endurance (on the basis that necessity of going to bed equals 0,

and ability to go to work equals 100) has been charted daily and is shown in the accompanying graph. At the point where the line drops to zero he had felt greatly improved for some days and took much more exercise than usual. The manner in which his endurance decreased to zero in the course of several days following overwork is well shown. He fails entirely to develop endurance and muscular power by exercise. He actually becomes weaker. I have

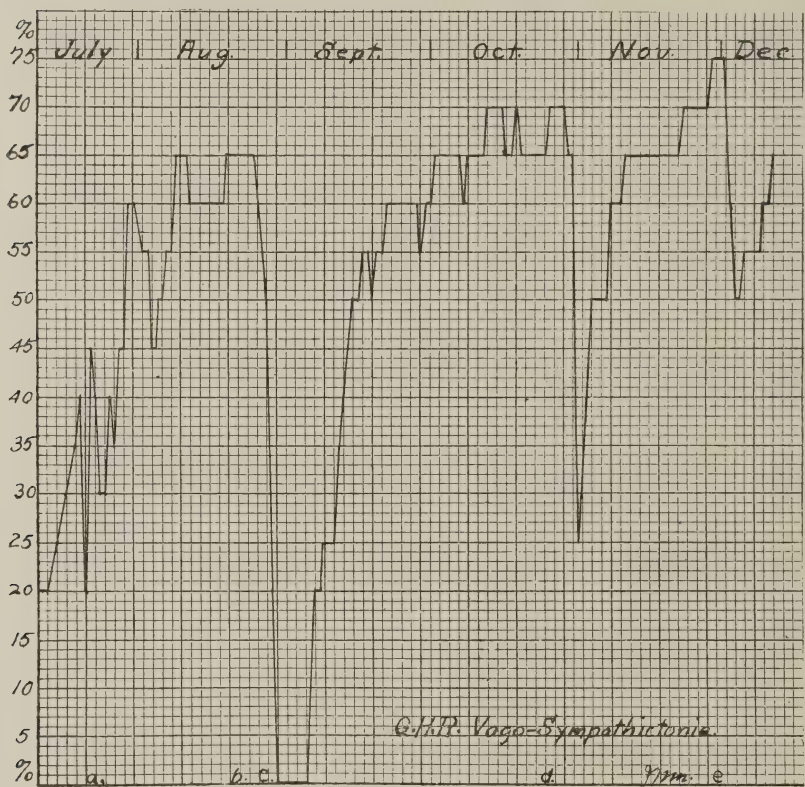


Fig. 1. Chart of Endurance, Case I.

0 = Necessity of rest in bed; 100% = Ability to work; At a, glucose tolerance test done; At b, overexertion occurred, "shopped" 1½ hours; At c, onset of vagotonia; At d, exposure, caught cold; At e, overexertion occurred, spent half a day about town.

called this an inversion of the hypertrophy law. Whether or not this is specific for vegetative imbalance, I am not yet prepared to state.

Diagnosis

The patient suffers from a cyclic vago-sympathicotonia, which I believe is secondary to chronic infection, probably cholecystitis, and overwork. The disabling factor is his vegetative nervous system imbalance. A discussion of the significance of each symptom cannot be entered into here. Dr. M. J.

FIG. 2. Tabulation of Vagotonic Symptoms. Seventeen consecutive cases. Relevant history and glucose tolerance tests also shown.

	1. G.H.R. (U.Dean)	2. H. J.G. (Phys.)	3. J. W. Y. (Bank)	4. J. E. D. (Exec.)	5. B. L.(Bus. Man.)	6. W. H. C. (Exec.)	7. F. J. H. (Mech.)	8. O. S. (Stud.)	9. J. R. S. (Exec.)	10. H. C. (Exec.)	11. J. J. M. (Sales)	12. J. B. (Pugilist)	13. L. R. (Exec.)	14. A. M. A. (Mech.)	15. H. N. H. (Sales)	16. J. H. B. (Exec.)	17. I. K. (Adver.)
1. Age.	42	50	56	31	38	50	38	20	26	52	34	27	47	29	41	35	56
2. Type. (a) Hard-working, indefatigable.	+	+	+	+	+	+	+	.	.	.	+	+	.	.	.	+	.
(b) Neurotic.	+	.	.	.	.	+	.	+	+	+	.	.	+	+	+	.	+
3. History of loss of weight.	+	+	.	.	.	.	.	.	+	.	+	.	.	.	.	+	.
4. History of overwork.	+	+	+	+	+	+	+	.	+	+	+	+	.	+	+	+	.
5. History of many acute infections.	+	+	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.
6. History of chronic infection.	+	+	+	.	.	+	.	.	+	+	+	.	+	+	+	.	+
7. In type (a) absence of neurasthenia.	+	+	+	.	.	+	+	.	.	+	+	+	+	+	+	.	.
8. Fatigability (a) Mental.	+	.	.	+	.	+	.	.	.	+	+	+	.	.	.	+	+
(b) Physical.	+	+	+	+	.	.	+	.	+	+	+	+	+	+	.	+	+
9. Depression.	+	.	.	.	.	+	.	+	+	.	+	+	+	+	.	.	+
10. Insomnia—wakes up early.	+	.	.	+	.	.	.	.	.	+	+	+	+	+	.	.	+
11. Feels sleepy and groggy.	+	+	.	+	.	.	+	.	.	.	+	+	+	+	.	.	+
12. Dry hair.	+	.	.	.	.	+	.	.	.	+	+	+	+	+	.	.	+
13. Brittle nails.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	+	.	+
14. Conjunctivae injected.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.
15. Epiphora.	.	+	.	.	.	.	.	.	+	.	.	+	+	.	.	.	.
16. Accommodation spasm.	+	+	.	.	.	.	.	.	.	.	+	.	.	+	.	.	+
17. Frequent winking.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+
18. Aschner's sign positive.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
19. Congested sinuses.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
20. Nasal discharge.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
21. Tinnitus.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+	+
22. Salivation.	+	.	.	+	.	+	.	.	+	.	.	.	.	.	.	+	+
23. Variation in salivation with posture.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+
24. Pharyngeal reflex absent.	+	+	+	.	.	.	.	+	+	+	.	+	.	.	+	+	+
25. Irregular breathing.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
26. Air hunger—"Breathing does no good."	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
27. Bradycardia.	+	+	.	+	+	.	.	+	.	.	+	.	+	+	.	+	+
28. Hypotension.	+	+	+	+	.	.	.	+	.	.	+	.	+	+	.	+	+
29. Pulsus irregularis respiratorius.	+	+	.	+	+	.	.	.	.	.	+	+	+	+	+	+	+
30. Vasomotor disturbances.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
31. Urticaria.	.	.	.	.	.	+	.	.	.	.	.	.	.	+	.	.	.
32. Pulsation in head.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.
33. Esophagospasm.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.
34. Hunger.	+	.	.	+	+	+	+	.	+	.	.	+	+	+	.	.	.
35. Gastric hyperacidity.	+	+	+	+	+	.	+	+	+	.	.	+	+	+	+	.	.
36. Gastro or pylorospasm.	+	.	.	+	+	+	+	+	+	.	.	+	+	+	+	.	.
37. Vomiting.	.	.	.	.	.	.	.	+	+	.	.	.	.	.	.	.	.
38. Biliary colic.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
39. Spasm of bowels.	+	.	.	.	+	.	.	.	+	.	.	.	+	.	.	.	.
40. Light colored stools.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+
41. Spastic colon.	+	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	+
42. Mucus in stools.	+	.	.	.	.	.	.	.	.	.	+	.	.	.	.	.	+
43. Frequent stools.	+	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.
44. Bloating in abdomen.	+	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	+
45. Sensitivity to foods.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
46. Hypoglycemic reaction.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
47. Low basal metabolism.	−16	−31	−18	+	−2	0	.	−7	−3	−21	−15	−9	−16	−15	8	+36	−15
48. Exhaustion after sexual activity.	+	.	.	.	.	.	.	.	.	.	.	+	+	+	.	.	.
49. Leucorrhea.	.	.	.	.	.	.	.	+	.	.	.	.	.	.	+	.	.
50. Polyuria.	+	.	+	+	.	+	+	+	+	.	.	.	.	.	.	.	+
51. Highly acid urine.	+	+	+	+	+	+	+	+	.	+	+	+	+	+	.	.	+
52. Sensitive skin.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
53. Hand and feet cold and clammy.	+	+	+	.	+	+	+	+	+	.	+	+	+	+	+	+	+
54. Hyperidrosis.	+	.	+	+	.	.	.	+	.	.	+	+	+	+	+	+	+
55. Myxedematous skin.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
56. Tremors.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	+
57. Fibrillary twitching of muscles.	+	.	.	.	.	+	.	.	+	+	+	+	+	.	+	.	.
58. Muscular cramps.	.	+	.	.	.	.	.	.	.	.	.	.	.	+	.	.	.
59. Inversion of hypertrophy law.	+	+	.	+	.	.	.	+	.	.	+	+	+	+	.	.	+
60. Subnormal temperature 97.5—.	+	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	+
61. Reaction to pilocarpine.	+	+	+	.	.	.	.	.	.	.	.	.	.	.	.	.	+
62. Lymphocytosis.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+
63. Glycuresis during glucose tol. test.	+	.	+	+	.	.	.	+	.	.	+	.	.	.	+	+	+
GLUCOSE TOLERANCE TEST Mg. per 100 c.c. of blood. HOURS 0	62	100	88	83	77	91	83	80	77	80	91	80	100	100	102	100	106
½	167	143	143	179	111	159	167	.	111	.	159	83	125	133	217	100	194
1	152	143	200	120	100	100	159	.	83	.	162	80	139	111	167	125	208
2	81	96	139	70	83	71	95	.	83	.	125	71	111	97	129	100	204
3	71	42	69	81	53	60	80	.	77	50	61	62	77	67	49	87	114
4	77	83	71	95	83	79	81	56	69	.	67	67	91	62	62	77	95

1. Age.
2. Type.
   (a) Hard-working, indefatigable.
   (b) Neurotic.
3. History of loss of weight.
4. History of overwork.
5. History of many acute infections.
6. History of chronic infection.
7. In type (a) absence of neurasthenia.
8. Fatigability
   (a) Mental.
   (b) Physical.
9. Depression.
10. Insomnia—wakes up early.
11. Feels sleepy and groggy.
12. Dry hair.
13. Brittle nails.
14. Conjunctivae injected.
15. Epiphora.
16. Accommodation spasm.
17. Frequent winking.
18. Aschner's sign positive.
19. Congested sinuses.
20. Nasal discharge.
21. Tinnitus.
22. Salivation.
23. Variation in salivation with posture.
24. Pharyngeal reflex absent.
25. Irregular breathing.
26. Air hunger—"Breathing does no good."
27. Bradycardia.
28. Hypotension.
29. Pulsus irregularis respiratorius.
30. Vasomotor disturbances.
31. Urticaria.
32. Pulsation in head.
33. Esophagospasm.
34. Hunger.
35. Gastric hyperacidity.
36. Gastro or pylorospasm.
37. Vomiting.
38. Biliary colic.
39. Spasm of bowels.
40. Light colored stools.
41. Spastic colon.
42. Mucus in stools.
43. Frequent stools.
44. Bloating in abdomen.
45. Sensitivity to foods.
46. Hypoglycemic reaction.
47. Low basal metabolism.
48. Exhaustion after sexual activity.
49. Leucorrhea.
50. Polyuria.
51. Highly acid urine.
52. Sensitive skin.
53. Hand and feet cold and clammy.
54. Hyperidrosis.
55. Myxedematous skin.
56. Tremors.
57. Fibrillary twitching of muscles.
58. Muscular cramps.
59. Inversion of hypertrophy law.
60. Subnormal temperature 97.5—.
61. Reaction to pilocarpine.
62. Lymphocytosis.
63. Glycuresis during glucose tol. test.

Gilfillan has kindly examined this patient from a psychiatric standpoint and reported, "Very materialistic, rather a lowered emotional tone." (The patient is a statistician.)

Other Cases

By reference to Fig. 2 (after initials) the incidence of the occupational types of cases is seen. While all suffered from a generalized vagotonia, further diagnoses were as follows: Patient 1, cholecystitis; 2, cholecystitis with lithiasis; 3, purulent conjunctivitis; 5, cholecystitis; 6, psychasthenia; 8, psychasthenia; 9, psychasthenia; 10, chronic interstitial nephritis, mitral regurgitation; 11, cholecystitis; 13, abdominal tic, sacroiliac strain; 14, tonsilitis, neurasthenia; 15, abscessed teeth, tonsilitis, chronic alcoholism, psychasthenia; 17, prediabetic state, constitutional inferiority. In the non-neurotic cases the incidence of cholecystitis is striking.

It should be stated here that in the table only the vagotonic symptoms are shown. Most cases, however, present at least one or two sympathicotonic symptoms. Also there is a tendency in all cases to a cyclic periodicity. Thus in case 2, the patient had in the one eye a purulent conjunctivitis regularly every 28 days which remained 4–5 days regardless of treatment by ophthalmologists before, during, or after the attack. The other eye was similarly affected but in regular periods of 21 to 23 days. They were never affected together except by coincidence.

Types of Individuals

A study of the types of individuals is exceedingly interesting. Claude, Santenoise and Targowla (3) have shown that vagotonia or sympathicotonia occurs in many psychoses, in psychoneuroses, and in neuroses. The symptoms complained of by psychasthenics are frequently sympathicotonic, those seen in neurasthenics and in cases of anxiety neurosis are often vagotonic. In this series cases 6, 8, 9, and 15 were cases of psychasthenia, case 12 was one of tic, case 14, one of neurasthenia, case 17, one of constitutional inferiority. The remaining ten cases were not neurotic in any sense of the word unless vagotonia itself is to be dismissed as a neurosis. But these patients were energetic, self-reliant, indefatigable workers, who expected more of an individual than one person usually is able to accomplish. In business they were hard taskmasters. Psychasthenics and neurasthenics as well as anxiety neurotics have lost confidence in themselves, they need help, comfort and encouragement, are of the proverbial clinging-vine type. But the ten patients mentioned had none of these characteristics. They did not even volunteer their symptoms—close questioning was necessary to bring these out.

Peptic Ulcer Type

Cases 4, 5, and 7 were of the typical peptic ulcer type. These patients had abdominal pain with great discomfort three to four hours after meals. They were awakened at 2–4 in the morning with gnawing in the stomach and hence complained of insomnia. This discomfort and pain was always relieved by food taking. They had passed through various hands with diagnoses of ulcer but no roentgenological evidence had ever been found. They all had gastric hyperacidity. While their blood sugars were not very low they all had severe hypoglycemic reactions. They were relieved by Sippey diet, but the symptoms recurred when the treatment was discontinued. Six meals a day relieved all their symptoms.

Hypoglycemic Reactions

Column 46 in the table shows that a hypoglycemic reaction occurred in all but cases 15 and 17. The blood sugar determinations shown at the margin of the table reveal that among those who experienced a hypoglycemic reaction the blood sugar at the lowest point ranged from 42 to 80 mg. per cent. Why a patient should suffer from weakness, hunger, excessive perspiration, and tremor with a blood sugar of 80 mg. per cent is not clear. Foshay (4) has shown that on administration of insulin the cell sugar content drops more rapidly than the plasma sugar. Whether this occurs in these spontaneous hypoglycemic reactions has not been determined. (Dr. W. B. Lewis of this clinic is now making separate cell and plasma determinations in another series to determine this point.) Patient 15 experienced no hypoglycemic reaction although the blood sugar reached a low point of 49 at the third hour. Evidently we must make our diagnosis with careful discrimination and not in terms of milligrams of sugar. Patient 17 did not have hypoglycemia at any time. He should rather be classed as a pre-diabetic. Incidentally, his vagotonia was of the longest duration in the series—symptoms since childhood. Thus the question arises whether these cases manifesting pancreatic overactivity finally exhaust the pancreas and become diabetic. Probably the most striking single fact concerning hypoglycemic reactions is that the patients' complaint is frequently duplicated during the reaction. This seems to be true regardless of the type of case. Not all the reactions are severe; some patients merely perspire profusely and feel weak. Others have temporary amblyopia.

Renal Glycuresis

Column 63 shows that glycuresis occurred in eight cases. One of these was a pre-diabetic. In the other seven we are dealing with renal glycuresis. Claude, Santenoise and Targowla (3) have shown that glycuresis after administration of glucose occurs in excitement states of psychoses. Cammidge (5) believes that renal glycuresis is often due to low blood calcium which in turn is due to hypoparathyroidism. Patient 1 positively improves on parathyroid gland and calcium lactate gr. 1/10 and gr. X respectively twice daily. The other cases have not been under observation a sufficient length of time to justify a definite statement. Further work is necessary to establish these points.

Basal Metabolism

Column 47 shows that the basal metabolism in this series ranges from —31 to +36. The latter finding occurred in a patient with a pulse rate of 62 and without the least evidence of thyroid enlargement in any direction by any means at our disposal. This was an early case of vagotonia. The patient is still working daily under high tension. He complained of nasal discharge and congested sinuses. The majority of the cases, especially the severe ones, showed a low metabolic rate. These facts give rise to the suspicion that the rate is at first high while the patient is working with unnatural vigor and energy only to cross the normal and become low when the vegetative system goes into permanent imbalance. Since Cannon (6) and his coworkers have shown that in all expenditure of energy not directed toward bodily reconstruction the sympathetic side is in the ascendency, it is tempting to assume that the vagotonics have exhausted this side by long continued abuse, and that the greater vagus thus gains the ascendency and forces recuperation. This assumption would also explain the fact that rest in bed and not exercise increases endurance in these patients. The above authors also demonstrated that adrenin has a specific action in overcoming acute muscular fatigue. May not the constant deficit of adrenin in the system account for the pronounced lack of endurance seen in vagotonia.

Diagnosis

The diagnosis of vagotonia can only be touched upon here—Eppinger and Hess devoted twenty pages to this alone. The writer wishes to emphasize a few points:

1. No symptom may be taken as indicative or contraindicative of vagotonia if an organic basis for it exists. Thus it is

characteristic for a vagotonic to have hyperchlorhydria, but if a patient suffering with pernicious anemia develops vagotonia his achlorhydria would not militate against our diagnosis of vagatonia.

2. A generalized tendency to hyperacidity in urine and gastric contents and vasomotor disturbances such as flushing, dizziness, pounding of arteries are very constant findings.

3. The writer believes that a hypoglycemic reaction during a glucose tolerance test is peculiarly constant in cases of generalized vagotonia.

4. The use of pilocarpine is not essential. The writer uses a list of symptoms somewhat similar to that shown in the table. If there is not a considerable number of objective symptoms present the diagnosis is not made. A mere excessive salivation with pilocarpine would not determine the diagnosis. This statement of course applies to *generalized* vagotonia such as we are considering.

5. A low basal metabolism occurs only in advanced cases.

Treatment

The treatment of vagotonia depends absolutely on the cause. Wherever the cause is still operative as in a psychosis, psychoneurosis including anxiety neurosis and neurasthenia, only a solution of the mental problem will give any permanent relief. The treatment outlined below may alleviate the distressing symptoms but there will be a recurrence until the mental basis disappears.

In the cases due to chronic infection and overwork, much can be done. All sources of toxemia should be carefully looked for and removed. After this has been done the treatment most effective has been found to be:

1. Rest, absolute avoidance of fatigue. Confinement to bed is necessary in severe cases—even for months.

2. Endocrine therapy. Thyroid is frequently indicated due to the frequency of low basal metabolism. Adrenal substance by mouth is of distinct benefit, especially in cases of severe hypotension.

3. Basic diet and alkalies to relieve the hyperacidity.

4. Ultra violet or sunlight in increasing doses given daily. Exposure should be general except to the head.

5. Tonic hydrotherapy. No rules can be laid down. Severe cases tolerate very little, carefully graduated applications will eventually lead to great tolerance.

6. Fruit between meals to counteract the hypoglycemia.

7. Careful attention to elimination.

8. Drugs—Atropine in sufficient doses to relieve spasm is of distinct benefit. This is however only palliative.

Conclusions

1. Vagotonia, beside occurring in psychopathic states and in neurotics, is frequently the end result of a strenuous life. It represents a fatigue of the sympathetic nervous system and the endocrines.

2. Hypoglycemic reactions are very common symptoms of vagotonia and are frequently the incapacitating factor. These are usually weakness, hunger, sweating, insomnia, and tremor.

3. Vagotonia may alternate in one patient with sympathicotonia.

4. Renal glycuresis occurs in about half the cases of this series but is not satisfactorily explained.

5. Treatment takes considerable time. Of all therapeutic measures, rest is far more important than any other. Drug treatment is only palliative.

6. In severe cases the patients manifest an inversion of the law of hypertrophy—they weaken by exercise.

7. The basal metabolism is probably at first high, then approaches zero, finally becoming very low.

BIBLIOGRAPHY

1. Eppinger and Hess. Vagotonia. Tr. by Jelliffe & Krause, Nervous and Mental Disease Monograph Series No. 20.
2. Harris, Seale. Hyperinsulinism and Dysinsulinism. J. A. M. A., 83:729, Sept. 6, 1924.
3. Claude, Santenoise and Targowla. An Attempt at a Biologic Diagnosis of States of Excitement and Depression. Arch. Neurol & Psychiat., 13:729, 1925.
4. Foshay, Lee. Observations Upon the Action of Insulin on the Blood, with Special Reference to the Cause of the Condition Known as Hypoglycemia. Am. J. Physiol., LXXIII, No. 2, 470, July 1, 1925.
5. Cammidge, P. J. Hypoglycemia. Lancet, London, CCVII, 1277, Dec. 29, 1924.
6. Cannon. Bodily Changes in Pain, Hunger, Fear, and Rage. B. Appleton & Co.

POSTENCEPHALITIC RESPIRATORY DISORDERS

REVIEW OF THE SYNDROMY, CASE REPORTS AND DISCUSSION

(Continued from page 371)

By Smith Ely Jelliffe, M.D., Ph.D.

of New York

Case 62, p. 274. Insomnic and hypomanic type in a ten-year-old boy previously healthy. On February 19, 1920, the boy vomited his breakfast and complained of pains in the abdomen. Nevertheless he went to school until the 21st. He was unable to sleep that night or the next day. His grandmother died at this time, to which event the child referred his troubles. On the night of the 22d he became delirious, saw wild beasts, and began a hiccough which lasted intermittently all night. Next day he was calm but complained of headaches, pain in the limbs, and had no appetite. He got up on the 23d but from this time on was unable to sleep at night. He would walk around at night, cry out, "Thieves; I am dying; I want to die"; would open the windows, see the faces of men, hear their noises and voices. During the day he would sleep twelve to fourteen hours. During his stay at the Salpetriere, beginning in July, 1920, the night terrors persisted. One night he tried to cut himself with a broken bottle. By September he had improved greatly; slept during the night and in daytime until noon. During the day he would play with other children but had the habit of continually blowing at objects. In October he left the hospital but the blowing tic still continued. In February, 1921, he reëntered the hospital because of his naughtiness. He would strike others and break the windows, etc. He blew at objects, or would spit on the ground or at the people. When reprimanded he would say nothing and continue to puff. In June, 1921, he had atonic convulsion and next morning he had puffing attacks with dyspnea. Inspiration and expiration were greatly accelerated; nasal expiration. This respiratory crisis lasted several minutes and he was very much exhausted after it, sleeping through the examination of the physician. His respiratory crises continued, although there were no more convulsive attacks. One day he climbed a tree and urinated upon the heads of the patients in the courtyard. He was then sent to St. Anne and later permanently interned at Vaucluse. His intelligence apparently was intact, although he was only mentally at a six-year-old level. He continued to puff at objects and frequently into his hands, as if it were a musical instrument (cornet). He rolled his tongue around in his mouth, would strike his knees with his fists in crises, and had typical tachypneic attacks. After two years the condition remained as described.

Case 63, p. 275. A short and wittingly incomplete account of a nine-year-old boy who in March, 1920, had several nights of insomnia, delirium, then diplopia and strabismus. He was in bed three weeks, sleeping most of the day and agitated most of the night time. By May he talked all night and walked around. During the day he slept. He became irascible and had crises of tachypnea with symptoms of respiratory distress. He complained of unpleasant scraping sensations in his throat. His mental condition demanded interning.

Case 64, p. 276. A thirteen-year-old girl with hypomanic and respiratory difficulties. In October, 1919, patient had a jaundice with fever, headache, and vomiting, and was confined to bed for eight days. In November she went to school but was always tired and had a headache. In January, 1920, on returning from school, she became excited, began to sing, and could not sleep during the night. She then had choreic movements and was delirious. A lethargic period followed. By February she could sit up. She had involuntary jerky movements, right side. By April she began to hawk, and then had whooping cough-like attacks. Then increased salivation and spitting took place with the increased coughing and she was diagnosed a "neuropath." She had lost all interest in everything. By June, 1921, she began to spit at everything and everybody. "It was too much for her," she said. In August, 1921, rude speech began and tachypnea was pronounced. They were by January, 1922, 35 to the minute. There was much irregularity in the respirations, in which a period of tachypnea would be followed by a period of apnea of a few seconds, followed by a deep superficial inspiration, then a new expiration like a sob. The child cries, "I suffocate, I suffocate; I cannot breathe," after which she yawns abundantly as if one hungered for air. She is quite intelligent in her answers during all this. She laughs and cries alternately. She had a rapid pulse. (Pneumograph figure 32.)

Case 65, p. 278. A twenty-year-old girl. On January 5, 1920, she had an attack of encephalitis with delirium lasting two days, with some electric-like jerky attacks in arms and legs. She was in bed three weeks, agitated and sleepless. She appeared well, but two weeks later she began to vomit. Every evening, after dinner, without pain and without nausea, she would begin to vomit. Later she could dance all the evening. This evening single vomiting spell lasted about six minutes. She then had a compulsory feeling she had to go to the toilet. "It is too strong for me," she would state. She would go, stay there half an hour, and without diarrhea or sometimes no movement, nevertheless felt the urge. At night she felt no such urge, but slept badly or none at all. By November, 1920, this situation had cleared up, but she then began to puff, slightly at first and intermittently until it became excessive, and in February, 1922, two years after the initial delirium, came to the Salpetriere seeking relief for her tachypneic attacks.

In the course of a month after the blowing began the respiratory diffi-

culties became constant day and night, although the night sessions were intermittent. This respiratory situation ceases when the patient is much interested in some external situation. She states to her attendants she "feels wicked" inside—wants to throw everything in the fire—but the nurses say she is well behaved but seems to have a strong tendency to rummage about into things. She wants to eat and drink all of the time, night and day. She has buzzing in the ears only at night.

The tachypnea involves chiefly the costal and the upper accessory muscles. Graphic examination shows (1) strongly accelerated and ample respirations; (2) apparent conservation of rhythm of expiration and inspiration; (3) the reappearance of a normal respiratory rhythm at times even retarded and presenting true pauses upon performing an act such as writing, sewing, which requires continuous attention.

Short discussion as to the differentiation from pithiatism.

Case 67, p. 282. Girl, aged fourteen and one-half years, who on March 4, 1920, complained of a frontal headache and inability to sleep, with a slight fever. She remained in bed two weeks, sleeping all day but unable to sleep at night. Diplopia on the fourth to fifth day of her illness. After two weeks she got up but felt weak. About April 1st she had a weakness in the face, the mouth being drawn towards the left. At this time every evening about 5 o'clock she began to make grimaces with the eyes and the mouth and began to talk to herself, a slight tendency towards which was present during the day. She began to grow impatient, irritable, and sad. She lost twenty-five pounds in weight. She entered the Salpetriere in January, 1921, because of an intractable insomnia and nocturnal agitated crises. She then had a mild parkinsonism. In July, 1921, she began to have tickling sensations in the throat and convulsive respiratory cough-like attacks, resembling whooping cough. She also had polydipsia and polyuria. This whooping-like respiratory disturbance came on eighteen months after the initial symptoms, and had persisted nine months at the time of this report.

Case 68, p. 283. An eighteen-year-old boy who came to the Salpetriere for insomnia, dyspnea, and agitation. He had had an attack of encephalitis in March, 1922. It had begun with insomnia, agitation, and an hallucinatory delirium which had lasted a week. He saw Napoleon, had a diplopia and ptosis, and was lethargic for about six weeks. He then recovered, with slight feelings of sleepiness. About the end of June he began to be agitated towards evening—6:30-7:00—and began to breathe differently. He stated that "he felt the need for some change, and to breathe like that, otherwise it would seem as if he would fall to the ground and suffocate." A painful heavy sensation lasting for a moment would be felt in the heart, in the back. He yawned frequently. Could not sleep. At times he had the impression the air would come as high as his nose. These breathing attacks were characterized by their great slowness—12-15-17 to the minute. There are distinct apneic periods during these bradypneic inspirations lasting six to seven seconds. During the

deep inspiratory phase all of the accessory muscles enter into activity and then six or seven of the deep inspirations occur in a minute, the intermediary respiratory movements being almost imperceptible. The diaphragmatic movements were uninvolved, save at times a very short, brief spasmodic contraction would take place, independent of the chest movements. No cyanosis. Polydipsia, polyuria, polyphagia, all were marked.

Wigert[2] reports the case of a child of eleven years. Lethargic initial phase, January, 1921. Afterwards various respiratory troubles: (1) Continuous coughing, eventually ending in fits with tonic spasms, cessation of breathing, opisthotonos. (2) These symptoms having lasted for some time, they changed into fits of sneezing, in spells, by day or by night, often heaps of fits in the same day, lasting each a quarter of an hour or half an hour, very noisy, she standing a little bent forward. No loss of consciousness. Then (3), some time later, some other peculiar respiratory symptoms occurred: She would stiffen in apnoe for quite a long time, stretching the whole body, emitting gutteral sounds, or clasping her hands together, shaking her garments, etc.

During 1922 she had three or four epileptic seizures (no Jackson type) with loss of consciousness.

Possibly there was a slight hypokinetic component, a certain degree of amimia, and sluggishness of movements. Psychically, she was bright; no true "hysterical" characteristics.

Parker's[3] paper reports eight cases, mostly related to the acute attack, but are of sufficient importance to be included in this brief summary.

Case 1 is evidently a post-encephalitic case in which there were, in January, 1920, neuritic pains, insomnia, polyuria, polydipsia, myoclonic jerkings, and a right-sided rigidity in a fourteen-year-old boy. Seventeen months later he developed typical grunting, expiratory breathing attacks, with marked forced movements in which he doubles up, places the head between the knees, and bends backward, with protuberant abdomen. In the "early morning stretch" or yawn phase he holds his breath for twenty seconds, then bends forward and releases his breath in a series of coughing grunts. There was no improvements in his condition.

Case 2. A girl of twelve had "influenza" in March, 1920, with high temperature, malaise, and headache. Insomnia, choreiform movements, and she became impulsive, stubborn, and disobedient. She was slowed up in her mental actions. Early in 1921 she began to breathe noisily and then had periods of holding her breath with her head thrown back. Later she would lose consciousness in an attack. The attacks were more frequent at night.

[2] Wigert. 2. Interscandinavian Psychiatric Congress, Report of. Stockholm, 1922, p. 69. Kindness of Professor Wimmer.

[3] Parker, H. L. Disturbances of Respiratory Rhythm in Children. Sequela to Epidemic Encephalitis. Am. Arch. of N. & P., VIII, 1922, 630.

Case 3. A girl two years and ten months old had attacks of holding her breath and grunting like Case 1.

Case 4. A boy of twelve. January, 1920, he had had an "influenza." Five months later he developed breathing attacks of holding his breath more or less like 1 and 3.

Case 5. A boy of ten with breath holding attacks and an epileptic convulsion. After a tonsillectomy he was worse.

Case 6. A six-year-old boy who, following a restless night in January, 1920, had a cold; had high temperature a few days and then it was noted he had a change of disposition. He sang and whistled all night and slept little. He also showed breath holding and noisy breathing. He had attacks of unconsciousness. He was noisy, restless, and aggressive; would get into tantrums, be abusive, use bad language, attacking nurses and doctors with his fists and feet.

Case 7. A woman twenty years of age. In February, 1920, an "influenza" with fever, diploplia, lethargy, and blurred vision. She had great sleepiness. When standing her respiration was 30 to 40, pulse very rapid; her face would become flushed. She had a parkinsonian habitus and tremor.

Case 8. Four-year-old girl; influenza in 1919, with breathing attacks later developing an imbecility.

Parker speaks of the apneic as holding the breath, and does not say whether these patients developed trance states, as Jelliffe's patient did. The author states some effort was made to investigate the psychological mechanisms, but he does not get beneath the manifest level and talks of "stern discipline" but "they found out their mistake," and went no further save for ineffectual hypnotism.

Leroy[4] reports some cases:

Case 2. A post-encephalitic parkinsonian who developed rapid breathing attacks and myoclonic attacks in the arm. She has slight confusional attacks.

Case 4. With left-sided post-encephalitic parkinsonian attack with paroxysmal rapid breathing.

Vincent and Bernard[5] in a society report speak of acute and chronic phases with respiratory difficulties in 28-, 12-, 21-, 31-, 34-, and 48-year-olds, respectively—not of service in our study—*fixation of chest idea.*

Roubinovitch, Baruk and Bariety[6] report to a society a boy fifteen years of age with an attack of encephalitis in March, 1920. In Novem-

[4] Leroy, Alph. Polypneé paroxystique ou permanente. Toux paroxystique: Aphasie paradoxicale. Symptomes d'Éncephalite. Bull. de la Soc. de Med. Mentale de Belgique, Oct., Dec., 1922, No. 194, 195.

[5] Vincent, Ch., and Bernard, Ch. Troubles respiratoires dans l'Éncephalite Épidémique. Soc. des. Hôp.: Bull. et Mem., XXXVIII, 1922, 1111.

[6] Roubinovitch, Baruk et Bariety. Un cas de troubles psychique et respiratoires consecutifs a l'éncephalite épidémique. L'Encephale, XVII, 1922, 659, November.

ber, 1922, he showed character modifications, was quarrelsome, disobedient, wicked. He had rapid breathing attacks which were associated as in Case J, here reported with phases of inhibition of all activity. There was a mild parkinsonism.

At this same time **Robin**[7] reports a boy of thirteen, naughty, turbulent, impulsive, with a tendency to embrace and kiss people. Had a paroxysmal polypnea, with afternoon and evening crises, crying aloud, biting the lips, and vertigo during apneic periods. Strong oculocardiac reflex.

At the November 9 meeting of the Paris Neurological Society **Babinski and Charpentier**[8] report some cases.

Case 1. Young woman, twenty-seven years of age, who had an attack of encephalitis in March, 1919. In May, on resuming her work, mild parkinsonism appeared. On going to bed at night she also had difficulty in breathing. In May, 1921, after an uncomplicated childbirth, the respiratory difficulties increased. At the moment of inspiration the nares are pinched in and expiration is loud and violent. At times there is rapid breathing, but more often it is slow, even to six per minute. When so marked there is frequently a spasmodic state which interrupts the breathing several seconds, followed by a noisy expiration as though she would blow out a candle with her nose. She says she can control it a little. Respiration is normal during sleep.

Case 2. Young man of eighteen; encephalitis in February, 1920; in bed two months. At the end of the year he had to leave school. He had rapid and noisy breathing in the morning and at night. He sniffled. In 1921 he had to leave school again because of the respiratory troubles, and he fell asleep almost constantly. His character underwent a gradual change. He developed a mild parkinsonism and had attacks of irregular rapid and puffing breathing.

The first patient could partly control her attacks, and by the well known faradic device the attacks could be mitigated. The authors thus speak of hysterical-organic combinations.

In the discussion of this presentation **Souques** details a related observation and also spoke of a patient who, although able to control similar breathing difficulties, yet nevertheless died five days later of her encephalitis, and **Vincent** states that most of the post-encephalitis parkinsonians have respiratory difficulties of various types, but mostly of the paroxysmal tachypneic type.

Also in the discussion of Babinski and Charpentier's paper, November

[7] Robin, M. G. Troubles mentaux consecutives a l'éncephalite léthargique chez les enfants. Troubles mentaux et troubles respiratoires. L'Encephale, XVII, 1922, 660, November.

[8] Babinski, J., et Charpentier, Al. Syndrome Parkinsonien fruste post-encéphalitique. Troubles respiratoires. Rev. Neurol., 1922, XXXVIII, 369. Seance de Nov. 9, 1922.

9, 1922, **Bouttier**[9] adds a short clinical statement of a tachypnea case in a fifteen-year-old boy for whom he tried the old fashioned brutality method of painful electrical treatment. For forty-eight hours they thought they had cured the patient, but the symptoms returned and continued to evolve.

During 1923 the studies continued to appear. In January, E. Bernard[1] gives us a general review of the respiratory troubles occurring in lethargic encephalitis. It concerns itself chiefly with the thoracic mechanisms and mostly with the polymorphous types seen in acute cases. His review so far as the chronic types is concerned is confined to the reports of Marinesco, Beriel, Babinski et Charpentier, Hardoin, Marie, Binet et Levy, Souques, Vincent, and Bernard, whose case reports have already here been summarized.

The newer studies are those of Hagelstam, Runge, Francioni (second communication), Negro, Roch, Schmidt, Chiray et Lafourcade, Fiamberti, de Saussure, Leroy et Montassut, Ballif, Ballif et Marz, Urechia et Mihalescu, Buzzard, Hinds-Howell, and Symonds.

Hagelstam[2] draws upon his experience in the epidemic in Finland from the Helsingfors Marien Hospital of 1920–21, where he observed some ninety cases with a mortality of 16 per cent. He here reports four histories only in which the neurotic component offered certain interesting nosological difficulties. Cases 1 and 2 only of interest for this discussion.

Case 1 was a ten-year-old boy seen in February, 1922, who had had a typical encephalitis attack in November, 1920. Some few weeks after his apparent recovery he commenced to hawk mucus from his throat. After a *tonsillectomy* this ceased, but he then began to have snorting and sniffing attacks, although there was little or no secretion in the nose. He then developed laryngeal coughing attacks, which lasted all the summer of 1921, and he breathed as though he had asthma. In these attacks, which came on frequently, he would have deep inspirations and deep expirations with much salivation and shivering tremors. He would cry and complain of great fatigue and also say he was hungry and thirsty (compare shivering attacks of Jelliffe's case early in his respiratory crises and great thirst). During the attack the patient is completely possessed by the process and seems neither to see nor hear anything going on about him. He does not answer and his character has become more selfish and unresponsive to control. Strong disciplinary control in the hospital reduced the number of attacks, but they recurred as soon as he returned home.

Case 2. A seventeen-year-old acute case of encephalitis with respiratory disturbances. Not of interest in this discussion.

[9] Bouttier. Rev. Neur., XXXVIII, 1922, 1376.
[1] Gazette des Hôpitaux, XCVI, 1923, 84, January 20.
[2] Hagelstam, J. Postencefalitiska Neuroser. Finska Lakares Handlingen, LXV, 1923, 69, January, February.

Winther[3] reports two children, eight years old, infection two and three years ago, respectively. Persisting mental excitement, disturbances of sleep, moral defects, etc. Tics: Sniffing, groaning, in the one child occurring in paroxysms, the patient reminding of somebody who has run a long way.

Runge[4] has given us the most detailed and thoroughly worked out individual case in the literature. It concerns a young theological student of twenty years of age who was somewhat delicate (effeminate), physically and psychically, who developed a protracted "grip" eighteen months previously. After this there developed very slowly a mild akinetic-hypertonic motility syndromy, with slight rigidity of the arms and body. He had definite aboulia, apathy, lack of initiative, reversal of sleep formula and mental changes so frequently found.

He had, moreover, paroxysms of rapid and deep breathing which, according to one version, had begun about one year after his first attack of grip, according to another earlier. These breathing efforts were accompanied by marked puffing and he had lost a position as an instructor because of them. He went through a disappointing love affair and then the breathing attacks became more severe, and during them he would make serious efforts to choke himself in a great effort towards getting some sensation by pushing both of his fists just beneath the larynx. He would thus become pale from cutting off his breath. On being restrained the breathing was deep and rapid and he would puff through his nose. (X made precisely similar nose puffings.) This performance would be repeated maybe fifty times an hour.

Asked why he wished to choke himself, he says "he has an instinctive feeling he must do it." "He does it without his willing to do it." His earliest effort at choking was carried out by means of a handkerchief, and during the effort he experienced a voluptuous feeling accompanied by giddiness. There seems to be a reciprocal relation between breathing attacks and choking efforts. If the former are stronger the latter are less determined. The heavy breathing attacks almost result in the same voluptuous sensation. In the choking efforts he arrives at a kind of orgasm to reach which all external or internal bonds must be broken. (See later the rôle played by J. in X's dreams.) Hypnotic treatment for a year. Some definite betterment and the general uncovering of a masturbatory compulsion.

The patient also had, like Jelliffe's case, tetany-like spasms. (See also Barker and Sprunt's case, which Runge has overlooked.)

The details brought out by the hypnosis will be dealt with more in detail in discussing etiological factors. Runge's case is of great

[3] Winther. Proc. Neurol. Soc., Copenhagen, May 27, 1923. Kindness of Professor Wimmer.

[4] Runge. Psychopathie und chronische Encephalitis Epidemica mit eigenartige Symptomatologie (Larvierte Onanie). Archiv f. Psychiatrie, LXVIII, 1923, 429, January.

interest in connection with Jelliffe's case and those of Witzels, but one gets no light on the situation by Runge's use of the conception, psychopathic, behind which fiction label he does not go. Everyone is latently " psychopathic " if the upper level discharge mechanisms are removed by no matter what process. The " lust " in war, for instance, is not confined to " psychopaths." " War " is the symbol of the uncovering lesion and the causation of the regression, but of this general situation more later.

In a second communication of **Francioni's**[5] the author discusses the physiopathology of these respiratory attacks and adds a new case of a boy of eighteen affected with encephalitis in January, 1921. Several months after an apparent cure he began to have respiratory attacks with vasomotor disturbances and oscillations of great anxiety, during one of which he attempted suicide. (See Runge's case also.) He had a definite parkinsonian status. The respiratory attack lasted on the average one to two minutes. He would get red in the face, open the mouth, stick out the tongue, breathe noisily, and develop to a great state of unrest and painful sense of constriction, as if he would die of suffocation. The pneumograph showed two types of respiration.

Negro[6] cites the clinical history of a patient with typical parkinsonian syndrome and respiratory crises which occurred during the night. This patient was tranquil during the day time but in the night became agitated and disquieted. She would go in and out of a room incessantly. During the day the respirations were tranquil and regular, mounted up to thirty to forty a minute during the night, the mouth half open. This state of excitement would mount almost to that of a delirium. The respirations would mount to seventy or eighty to the minute, arhythmic, with periods of suffocation. These paroxysms repeat themselves every twenty to thirty minutes, last forty to fifty seconds or more, the pulse becoming small, frequent, irregular; the extremities cold, cyanotic. In the early hours of the morning the respirations gradually come down to normal.

Calls attention to Beriel's paper *re* hysterical nature of this syndromy, but makes irrelevant remarks that electrical treatments had no effect (p. 179).

Short report of case by **Roch**[7] seen in 1922, more completely reported in a Geneva thesis. A young man, two years of age, with parkinsonism, apathy, and aboulia, with paroxysmal dyspneic attacks causing

[5] Francioni, G. Ancora sopra le alterazione del respiro nella encefalite epidemica. Patogenesi e rapporto con le crisi emotivi. Il Cervello, II, 1923.

[6] Negro, Fedele. Fisiopatologia delle sindromi Parkinsoniane. Torino, 1923, p. 178.

[7] Roch, M. Les Troubles respiratoires dans l'éncephalitie épidémique. Rev. Med. de la Suisse Rom., XLIII, 1923, 129.

him to retire to a corner, anxious and cyanosed, with open mouth, thus enabling him to make a series of rapid and noisy respirations lasting a minute or so. In his worst periods these occur every hour. The patient can control them and they can be modified by distraction. No treatment was available.

Pierre Schmidt studied this case in detail and incorporated it into a thesis[8] in which he gives short résumés of some of the material here cited.

Case 5, by **Chiray et Lafourcade.**[9] Sixteen and one-half years old; had typical lethargic encephalitis in 1919 (Netter). November, 1922, enters Hotel Dieu with paroxysmal respiratory attacks and obesity (p. 42). His first attack was apparently determined by a very serious discussion. It was preceded by a period of loss of consciousness. The first dyspneic crisis lasted half an hour and terminated by repeated yawnings. A second attack a week later, following a controversy. The attacks then became more and more frequent until they occurred daily and then five and six a day—maybe ten. A depressing idea or a contradiction may be sufficient to start one. The onset is abrupt and they last about ten minutes. The polypnea mounts to sixty to eighty-five a minute, holds this rate for several minutes and then comes down. No cyanosis and no palpitation. The rhythm may be diverted but only for a time. The diaphragm seemed to be fixed at the margins but free in the center, and this was the mechanical substratum of the polypnea. Loss of memory and adiposity were striking accompaniments.

An interesting case history by **Fiamberti**[1] of a typical post-encephalitic respiratory sequel with recovery, and discussion of the outcome of certain post-encephalitic sequels. This latter is not of interest for the purposes of this presentation although of much importance in the general discussion. The author is conversant with most of the work on these respiratory sequels. His patient, twelve years old, a girl, had an encephalitis in December, 1919, with day sleep and night wakefulness. Slowly began to develop changes in character and in respiration. She was first seen in March, 1922, when she looked like a typical parkinsonian sine tremor. He classes his patient using Francioni's (Laignel-Lavastine's) bulbo-vagohypertonic terminological description.

The pneumographic tracing of her attack shows rapid breathing, thirty to minute, for about thirty seconds, then an apneic phase, fifteen to twenty seconds, then hasty breathing, etc. During the attack the patient has an anxious suffocating feeling. She may be sitting or semi-dozing

[8] No. 1077: Thése de Geneve. Contribution a l'etude des phénomènes Respiratoires de L'Encéphalite Léthargique. Jan. 19, 1923.

[9] Chiray et Lafourcade. Encephalite épidémique ou séquelles combinées, respiratoires, bradytrophiques et psychiques. Bull. et Mém. Soc. med. d Hôp., XLVII, 1923, 406.

[1] Fiamberti, A. M. Encefalite epidemici cronica, a tipo respiratorio, con esito in quarigione. Note e Riviste di Psichiatria, XI, 1923, 363.

upon a stool or chair when she suddenly rises to an erect position and makes strong inspiratory efforts in which she bends forward (compare opposite opisthotonos positions of other cases) almost double, in great anxiety, salivates; remains in this bent-over position almost touching the floor. She stays in this position a few seconds to half a minute, impervious to stimuli, during which time the eyes are closed, the salivation is more intense, the face is weepy, reddened as if by bloody stasis. The pulse is arhythmic. The patient then straightens herself out brusquely and, carrying her hand to her throat, makes a forced effort of expiration; these are repeated in a rapid series, when the patient sinks into a heavy exhausted sleep. At times in the expiratory stage the patient may discharge her urine or feces. She is conscious. After a paratyphoid attack in February 16 to February 20, 1923, the patient suddenly ceased to have her respiratory attacks and little by little she made a complete recovery (remissions as in paresis?).

De Saussure's[2] case is partly relevant for this discussion since it bears particularly upon the psychogenic components. The patient, a young woman of twenty, developed a marked spasmodic tic of the masticatory muscles May, 1921, after an illness which was suspicious of an encephalitis in February, 1920, a terrifying nightmare ushering in the performance. "She had seen a dead woman who was looking at her from behind the window." As the expression of a death-wish directed against an irritating grandmother, this is of note. During the spasm, respiration stops, then there is a short period of rapid breathing in which the excursions are more ample, at first rapid, then slow. The spasmodic attacks come on apparently as a defense against a persistent yawning which at first lasted about fifteen days and recurs at intervals, which when persisting give rise to the spasms and polypnea which is accompanied by great thirst. She later had periods of compulsory use of vulgar language, coprolalia (Gilles de la Tourette's disease of former years). She also had a definite intellectual reduction and could not give spontaneous associations in psychoanalysis.

[2] de Saussure, R. Discussion sur l'etiologie d'un tic survenu quinze mois après une Encéphalite léthargique atypique. Arch. Suisse de Neurol. et de Psychiatrie, XII, 1923, 298, July.

(To be continued)

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

The Four Hundred and Twenty-sixth Regular Meeting, February 2, 1926. The President, Dr. I. Abrahamson, Presiding.

A CASE OF NEURORETINITIS WITH RECOVERY

Dr. Irving J. Sands

(*Author's Abstract*)

J. W., male, thirty-two, married, white, on October 7, 1924, complained to me of increasing loss of vision for a year.

The family history was negative. He was born in Ireland, and had a normal infancy and childhood. He had two years of schooling. He emigrated to the United States in 1916. He denies venereal diseases, drugs, or alcoholic excesses. His wife was never impregnated. On October 1, 1918, he received a gunshot wound in the left wrist, and was in an army base hospital two months. He worked steadily as a dairyman until the latter part of October, 1923, when he stopped because of dimness of vision.

Physically he was well developed, but undernourished. Heart and lungs were negative; blood pressure, 135/75. Gait and station, coördination and reflexes were normal; no sensory disturbances. The pupils were equal, regular, but reacted sluggishly to light and accommodation. There was marked blurring of both discs, especially on the nasal borders. The retina at the edge of the discs was also involved. The disc vessels were congested, but no hemorrhagic areas were seen. Vision was 10/200 in each eye. There was no other cranial nerve lesion.

Urinalysis was negative. The blood count showed 4,350,000 red blood cells; 6,800 white blood cells, with a differential count of 63 per cent polymorphonuclear leucocytes, 35 per cent lymphocytes, and 2 per cent eosinophiles. Blood Wassermann, negative. The spinal fluid of normal pressure, showed three cells, one plus globulin, sugar present, negative Wassermann, and the colloidal gold curve was 0000111100.

Dental examination revealed periapical abscess of the upper right first bicuspid, and an infected root of the left upper first bicuspid. X-ray examination of the skull sinuses showed multilocular symmetrical and normally illuminated frontal sinuses, normal ethmoids, and normal maxillary antri. Nose and throat examination revealed large, infected tonsils, and hypertrophied right turbinates. Diagnosis: Neuroretinitis, bilateral. Dental care was immediately instituted.

On January 30, 1925, there was both subjective and objective improvement in his eye condition. This steadily continues. Tonsillectomy was done on October 5, 1925. On January 22, 1926, eye examination revealed normal discs, vessels normal; vision 20/20 in each eye.

Discussion: Dr. G. H. Hyslop asked if the patient had any central scotomata?

Dr. Sands replied no.

A PSYCHOANALYTIC INTRODUCTION TO A STUDY OF THE CONDUCT DISORDERS OF LETHARGIC ENCEPHALITIS (WITH OUTLINE OF PLAN FOR PSYCHOSOCIAL RECONSTRUCTION)

Dr. L. Pierce Clark

(*Author's Abstract*)

The author constructed a hypothesis upon which he based his theory of conduct disorders of post-encephalitics as follows: that the nature of the diffused lesion in the infectious process left residual lesions in the brain which he designated as the ego organ of the mind and because of this lesion the free flow of libido imprisoned in the lesion was incapable of healing and developing the proper integrative function of the individual. This disturbance of the imprisoned narcistic libido periodically manifests itself in various sorts of conduct disorders at the different levels of the wounding of the ego libido. Under various types of adaptations the individuals regressed to different instinctual levels, thus giving a variety of conduct defects in proportion to the degree and extent of the lesions. He further considered the nature of the disorder as a pathoneurosis organically conditioned in which there was an insufficient power of normal integration of function of the ego organ of the brain. He briefly indicated the extent of the social problem and the types of insufficient recoveries and relapses in a series of cases, and detailed the psychoanalytic reëducation in one case over a period of ten months; and finally cited in detail the beginning analysis of a very severe case of conduct disorders in a post-encephalitic patient also afflicted with the Parkinsonian syndrome. The results of analytic sessions are by no means final as the length of time was insufficient to show what effect psychoanalysis might have in one suffering from a degenerative brain lesion. However, it is just possible that through analysis the symptoms may disappear for a time and give an opportunity to build up the psyche to keep abreast of the degenerative process. The author ended his paper by outlining a plan with estimated cost for organizing an observation home for the intensive study and training of a group of cases along psychoanalytic principles.

Discussion: Dr. M. W. Raynor said: I am very much interested in Dr. Clark's paper. The State Hospital Commission, after the influx of post-encephalitis cases in the State Hospitals, arranged

to care for a group of boys and girls under sixteen at the Kings Park Hospital, and we now have there about fifty of these children approximately twelve years old. We have had about eighty in the last two years. All of these cases have been certified as having psychoses. There has been considerable deviation in their conduct, and some of them showed evidences of hallucinations and elusions. We have two cottages, one for the boys, and one for the girls, each holding twenty-five patients. We chose the personnel with especial reference to the care of these children. The personnel consists of nurses, an occupational therapist, and a school teacher. These children presented a practical problem to deal with. It was impossible to classify them or care for them on wards with adults. It was also desired to provide a proper psychological atmosphere for them. The children have been trained to take an interest in their own welfare and to care for themselves and their cottages. Their recreation has been organized and maintained under competent supervision. They have been given a certain amount of academic instruction, to which they have responded very well. The whole point has been to stimulate an interest in reality, and maintain that interest, if possible. A great deal of improvement has taken place in the majority of these children, but we have not been able to fully meet the situation because our personnel at the hospital has not been sufficient. We have not been able to go into great detail in mental analysis. We have, however, made a careful study of their personalities, their previous histories, the new psychological problems which have presented themselves to these children following their encephalitis, and their type of adaptation. An interesting thing is that when the children reach the age of about twelve, we have a new problem to deal with. They begin to show a quite definite sex trend, and at this point we have found that the sex abnormalities seem to be much more prominent and become more of a serious problem with them. Improvement is not rapid but over a considerable period of time there is an improvement seen in their general conduct reaction and in their emotional reaction. The explosive episodes are not so frequent nor so marked. Many of these patients showed some spasticities, not localized, but general. One would think of the Parkinsonian type. Their spasticities slowly cleared up. A number had the typical breathing syndrome, which has been about the last thing to show improvement, but in some cases this also has shown a marked improvement. I feel that it is necessary to analyze these patients' mental conditions if we are going to get a further marked improvement. Analysis will no doubt help them.

Mr. T. E. Uniker (by invitation) said: For several years I have had under my observation a number of post-encephalitic cases in a group organized by Dr. Clark. I thoroughly agree with Dr. Clark's and Dr. Raynor's conclusions. It is obvious that the immediate problem is not only to create the proper home atmosphere for such cases where the different types of occupational interests can be employed, but there is another need, namely, some therapy that

will take care of the compulsive, sadistic and masochistic behavior reactions so marked in these cases. Psychoanalysis offers us the means by which we can reach these cases, especially through the fantasy method as described by Dr. Clark. Under the fantasy method or a modified analysis my observations have been that all our cases showed immediate improvement. The respiratory and Parkinsonian syndromes together with the conduct disorders have all abated under this form of approach. It would seem that the plan as suggested by Dr. Clark for a small number of cases carefully studied and analyzed would give us the means by which we can organize the same therapy to apply to larger groups.

Dr. L. Grimberg said: There is no question that the paper of Dr. Clark is excellent; there are only a few things that I, as a neurologist, cannot explain at all. I am not so very well convinced that the majority of supposedly post-encephalitic disorders are really due to encephalitis. It has been my experience lately to see two patients: one with tuberculous abscess of the brain, the other with post-meningitis. However, in post-encephalitic conduct disorders are we dealing with narcissistic things? I have watched a number of children, and seen no real improvement. There has only been a change from one condition to another. We notice a similar change in plain Parkinsonian disease. To my mind also there is absolutely no relation between the severity of the lesion of the brain and the amount of conduct disorder that you find in the patient. I have seen patients with very slight attacks of encephalitis who showed great conduct disorder, and I have seen patients with severe attacks show very slight conduct disorders. I cannot believe that the Parkinsonian tremor is due to a masturbatory tendency in the patient. I think it is an organic lesion of the extrapyramidal tracts. I am not a psychoanalyst, but it seems to me that a number of discharged patients from Kings Park have not shown much improvement, whether psychoanalyzed or otherwise.

Dr. Smith Ely Jelliffe said: I have a great deal of disinclination or diffidence about discussion of this problem, because we have had encephalitis for breakfast, luncheon and dinner, and holidays and Sundays, since 1917, when von Economo started the row over there in Vienna. Most of you know that at least two or three thousand papers have been published, and anyone who would attempt to try to envisage in any philosophical way the entire series of phenomena I think will meet with a certain amount of difficulty. Hence the diffidence that I express. Furthermore, I stand here in a sense just as an ordinary doctor, not even a neurologist, and least of all with any claim to be a psychoanalyst. I am, of course, at the same time very much in sympathy with much that Dr. Clark has said, and if by way of discussion, because without a certain amount of difference of opinion there could be no discussion, I seem to offer some slight variations, if not diametrically opposed views, I trust he will understand it is not in any spirit of contention, but rather as a component part of the subject, so that other points of view can come under consideration. Dr. Clark knows, and most

of the other members of this Society know, that since 1911 I have been boring you with talks about the psychogenic component in organic disease. In 1915 Dr. White and I published the first edition of a book called "Diseases of the Nervous System" in which the same program is not only announced in the introduction, but is found in small doses graduated to the developing intelligence of the average college student throughout all the pages of the book. We gave them a little, and then a little more in the succeeding three editions and then some more. We may some time revise the book and start with the right end instead of the wrong end, *i.e.,* start with the psychogenic end and then go through to the so-called physical end. One can see how the latest developments in evolution have made some of the processes through which evolution has gone comprehensible, whereas if one starts with the electron and the atom, one can only conjecture what might be in the course of time.

Dr. Clark says there is no correlation between the cerebral lesions and the symptoms. That is not so. A great many sound correlations between the symptoms and the lesions have been made by a number of observers. Any one who has gone over Kleist's many studies knows perfectly well that there are many such, and he is but one of the many observers, such as Zingerle, Förster, Naville, Hesnard, Wimmer, Hohmann, etc., etc. The symptoms do not necessarily have to be interpreted in a positive sense. They may be interpreted in a negative sense, and when I use these two words, I am thinking of Hughlings Johnson's idea about the "dissolution of function," *i.e.,* that a certain symptom is not necessarily due to a lesion in a definite place, but may result from a lesion in some other place, as in v. Monakow's diaschisis discussions one finds an elaboration of Hughlings Jackson's conception. Furthermore, I cannot agree with Dr. Clark when he says that there can be no bridge between the body and the psyche, nor am I certain that he quotes Sherrington correctly. In the first place there never was any separation. There is no need to build a bridge because there never was any gap. Soma and psyche are one; they always have existed together, and always will be. They represent in psychical or bodily manifestations different phases of the evolution of the functioning of a total human being, and different modes of reaching what the human being as a whole wishes to reach. In disease processes therefore different grades of dissolution of function may occur, according to the position where the lesion may be. In that sense I am a somaticist. I can refer Dr. Clark further to Dr. Küpper's interesting series of studies on the so-called localization of psychical functions; to Wilckins' paper in which is discussed three cases. His second case is of great interest: an encephalitis occurring in a feebleminded boy that also had a dementia precox reaction. Wilckins has given a beautiful description of the respective localizations of the processes which produced, not only his feeblemindedness, his dementia precox, and also the symptoms that newly arose in the course of the encephalitis, and I could go on quoting a large number of papers: Gerstman and Schilder, and so forth.

Dr. Clark further said that there have been no analyses made in these cases. In what sense he means "no analysis" is difficult to say. Runge's case is very beautifully analyzed, not by the strict psychoanalytic method, but it has been well analyzed by the hypnotic method. He made an interesting series of deductions, saying that the conduct of the patient was based upon a masturbatory complex. I have presented an analysis, more in detail than any other thus presented, of a patient in the June number of the JOURNAL OF NERVOUS AND MENTAL DISEASE, 1925, in which I have taken up the respiratory attacks, tremor, the flow of saliva, the greasy skin, and attempted to show analytically what they all may mean. Hauptmann's extremely interesting analysis in sixty-two pages of the Zeitschr. f. Neurologie u. Psychiatrie gives in detail an introspective orientation of the patient's own movements and his own feelings. This mode of description is not unlike the phantasy method of Dr. Clark. The patient himself fancied all these feelings, where they came from, and his own interpretation is given.

There is one more point I wish to mention. First, I feel that Dr. Clark is quite too specific when he spoke of the narcissistic neuroses as constituting the only type he observed in encephalitis. I do not think this is so. A great variety of stages are observable. We have all had a great deal of experience with encephalitis and I do not know how many hundreds I myself have seen. I have seen them here, in England, in France, in Switzerland, in Holland, Austria, and in Italy. The variations are kaleidoscopic. Nobody can attempt to envisage them, but one thing needs to be borne in mind. I said this at the discussion of the Research Society. I quoted Stärcke when he said he had been looking ever since he had been practicing medicine for what were called "normal" people. "Normal" is only a logical fiction. There are all kinds and stages of people. If one would use the "type" fictional conception such may be arranged more or less according to various grades of their psychosexual evolution. These differently developed individuals may be involved in an encephalitic process with a resulting acute or residual chronic psychoneurosis or psychosis (Dr. Clark, if I heard him aright, said they did not have any psychoses), but they nearly all begin with a psychosis, and there are a lot of residual psychoses. The resultants are largely determined, however, by the stage of the psychosexual evolution of the individual involved. If the individual is eight to twelve years of age, like the fifty or sixty children described by Dr. Raynor, we do not expect a complete degree of psychosexual evolution to the social standard. They must remain in a narcissistic stage. This fact may serve to explain why that type of person will not be able to be treated by the ordinary transference methods of psychoanalysis, but individuals who have advanced to such a stage of psychosexual integration, the so-called "average" or "normal" people can be handled just like any transference neurosis. I think Dr. Clark will agree with me in that respect. I think he has in mind mostly some of these lower stages of integration. I do not

mean "lower" in the sense of inferior; I am speaking from the standpoint of psychosexual evolution.

Dr. P. R. Lehrman said: Dr. Clark's paper is important in this: that he calls attention to a new method of managing narcissistic neuroses. At a recent meeting of the New York Psychoanalytic Society where Dr. Clark presented his phantasy method and Dr. Jelliffe in Socratic manner brought out the salient points of the technique, it appealed to us as a valuable modification of the psychoanalytic method in the treatment of the ego or narcissistic neuroses. We may be justified in viewing the personality sequelæ of encephalitis as ego-neurotic manifestations, when we bear in mind the fact that the physical sequelæ of this illness are the release of paleokinetic mechanisms. Similarly in the psychic sphere, it is the release of the paleopsyche or the narcissistic factors which is in evidence in post-encephalitis personality disturbances. An individual may be in an advanced stage of psychosexeual development and yet regress to the narcissistic stage as a result of encephalitis or other physical or psychic traumata. What Dr. Clark aims at is the mobilization of whatever libido he finds in his patients, and to convert it into object libido. He is thus able to take the lowest form of the ego and build it up towards the goal of the ego-ideal. In my own experience I have a case which will illustrate this. In the winter of 1920 I accepted for treatment a dentist who had post-encephalitic physical and mental symptoms. He felt incapable to practice his profession, and when he first consulted me he was in the employ of the street cleaning department as a snow shoveler. He showed other evidence of regression. After a year's treatment he recovered sufficiently to establish an office, and at present he is quite successful in his profession, though he still shows some evidence of the Parkinsonian syndrome. I began with the Freudian technique, but soon found that modifications were necessary for this patient. He obtained enough object libido to enable him to come back to the world of reality. We have seen other therapeutic measures help such patients. The Vanderbilt Clinic and Post-Graduate groups of encephalitics have been improved temporarily a few times. A few years ago a physician having returned from Vienna enthusiastically began treating these patients with typhoid vaccine and they improved for a time, but when he lost interest in that group, they regressed. Then another physician treated the same group of patients, and the same thing happened until he lost interest. This raising of the patients' level will recur with the coming of other enthusiasts of some mode of therapy, and the mechanism of improvement or regression will be lost sight of unless we make use of our psychoanalytic insight. In his paper to-night Dr. Clark is calling attention to this insight and also is giving us a method for the reconstruction of the post-encephalitic personality changes.

Dr. Joshua H. Leiner said: I would like to speak upon this subject from the somatic standpoint. A child of seven years had encephalitis a year and a half before I saw him. Following his attack he showed conduct disorders, character changes, together with

respiratory disturbances. When in my office he would run around the room, destroy things, bite, scratch, stuff himself with food, etc., and even urinate and defecate in his garments and on the floor. Four months after I saw him, he contracted a pneumonia with high temperature. After his convalescence he walked into my office with his gloves on his hands, a little walking stick, and deported himself like a little gentleman—a very dramatic change. The family doctor tells me that the child a year later reverted to his conduct disturbances again. This child improved because of certain somatic changes and improvement in his brain cells. I cannot correlate definite pathological symptoms and improvement, as in this case, with a therapy such as psychoanalysis. I can only speak of this case as a shock reaction occurring on the basis of foreign protein therapy. If Dr. Clark can explain this boy's improvement with the psychoanalytic method, I would like to have him do so, but I cannot see the bridge that will span the gap. After any shock therapy the patients will get better, but will revert to their symptoms again after a while.

Three or four years from now, if Dr. Clark's case will show improvement and no reversion, then we can speak of a cure, but otherwise it is only another type of therapy which probably will also be of temporary help.

Dr. Irving Sands said: I deem it a duty to discuss the paper because of the seriousness of the subject. Working in neuropsychiatric clinics every afternoon of the week, I am called upon to treat all types of encephalitic cases, and all sorts of post-encephalitic states. Many of the patients I have followed for years in the outpatient clinic of U. S. Veterans' Hospital No. 81. It is natural, therefore, that I should have formed an opinion about the subject in general. I am sorry that it is a pessimistic one.

In the largest number of instances, epidemic encephalitis is not a definitely acute condition with a decided termination. Most of the cases are of the subacute type. When there is apparent clinical recovery, there occurs anatomically ectodermic and mesodermic replacement of the destroyed tissue. There is, therefore, a constant change in the anatomical condition of the brain, and consequent clinical changes. We have tried almost every known sort of therapy, but without any real improvement at the end of any given time. Typhoid vaccines, mixed vaccines, iodides, sodium nucleolenates and aolan were given trials but all have not proven what we hoped they might. Our physiotherapy outfit is the best in the country, and we are utilizing it in our efforts to help these patients. Yet it too has not proven of real value. That does not mean that the various methods of therapy are useless, for they do help, but not to the extent as we and the patients would like them to help.

Any patient that can afford a rich regime presents no problem whatever. It is the everyday clinic case and even office case that presents serious problems. Take the post-encephalitic child who keeps the family awake at night. The wage earner is deprived of his sleep and a vicious circle is then established. The creation of a center of therapy at Kings Park State Hospital is a God-sent

gift for a few families. Many judges will refuse to commit children to a State Hospital, and many families will likewise object. The problem is not an easy one by any means. We have attached to our clinic psychoanalysts of acknowledged proficiency, and yet they have had little success in handling these patients. Another problem is the impotency which is so common amongst the male patients; nature seemingly attempting to limit the offspring of these individuals. Anybody leaving this room with the feeling that there is a definite concrete effectual means of managing these patients is greatly mistaken.

Dr. Gregory Stragnell said: Dr. Clark kindly let me read his paper before he presented it. My chief interest in the subject is not for the amelioration or the care of the conduct disorders of these cases or groups of cases, frankly, but I think that the following out of some such plan might help a great deal in giving us some clue to rearrange the conduct disorders of the bulk of the medical profession, which I think is far more important. That does not sound so good, but it is true. It seems to me that the important thing to derive from a plan which follows the lines Dr. Clark has worked out would be to follow a subject which has become very dear to me from the inspiration I have derived from the work Dr. Jelliffe has done, and which seems to me most important, and that is to realize some of the pathways over which the psyche manifests itself somatically, and through which the psyche is influenced by the soma. Really to try to divide them is rather presumptuous on the part of the medical profession, not only presumptuous, but extremely childish. I cannot conceive that such a thing can be possible, and I think the most important thing is for us to lose our respect for our own selves for the moment and to realize, as I have come to realize in my work more every day, that we can listen to a patient's story and prophesy not only the conduct disorder, but just about where we are going to have a tumor, or a pyelitis, and furthermore to find the organic weak spots, or rather, I would say, the spots where the stress is going to be laid, not only in the conduct disorders; where the soma is going to break through in an effort to find expression through those pathways, whether it is encephalitis, or a breast tumor, or a nasal catarrh, or a sinus, or anything you please, and those of you who insist on making gods of your microscopes and goddesses of your test tubes are going to be very much in the position that the ancients were with the multiplicity of their graven stone images. I think this is extremely important, and as I said before, I think it is a conduct disorder that we are all suffering from, when we limit ourselves to following narrow pathways. We too little realize that the organism is a unit of a larger unit, namely, the experiences which man has passed through from the time chemicals, light, heat and power united in some way to form a living cell. Life is experience, or function, and we will not be physicians in the true sense if we only think in terms of structure.

Dr. Clark (closing the discussion) said: Although we may have

had encephalitis as a continued topic for scientific discussion for several years, my effort here to-night is the first genuine psychoanalytic attempt to explain the mental symptoms. Frankly, I did not enter this field with any great hopes of radically removing the mental sequelæ of the infectious process. The main purpose was to reënter the field of the organic neuroses by the instinctual route rather than by a neurologic or biologic one, as I did in the tics several years ago, and as I interpret so much of Dr. Jelliffe's work still to be. While both methods have their advantages I hold that the strict psychoanalytic one is the better as Freud and Ferenczi have shown or at least suggested. I admit that I took as the paradigm of mental sequelæ the worst possible types of ego neuroses in conduct symptoms; not that there are not many others of the transference type but we see in many reports how the latter are reduced to a comparatively recovered state of mind, while no one as yet has made any encouraging permanent change in the intangible type which makes the subject of my thesis. As I think I have made clear in my paper, we succeed in entering the unconscious conflict in our cases by giving libido to our little patients instead of extracting it as in the transference neuroses. In the end we must expect that these children will objectivate their libido, but at first in order to break down the narcissistic protection to the imprisoned ego libido we have to give libido. We help them to organize their own lives about the soundest part of their still intact ego nucleus and to absorb our identified interest (libido) into the hegemony of their ego. The method of advancing this latter aim is the keynote as to whether or not the benefit gained by the patient shall remain permanent and stable. How to raise the power of ego integration is the great problem. It may not be counted as an essential defect in the nature of the ego until we have broken down all the narcissistic protection not immediately required to make the ego operative for normal living. My paper is a contribution to the psychoanalytic instinctual reintegration of the ego libido rather than a structural and neurologic approach to this problem, as in the past.

SUBACUTE EPIDEMIC ENCEPHALITIS. A CASE SHOWING AN UNUSUALLY WIDESPREAD DISEASE PROCESS

Joseph Salan, M.D.
(By Invitation)

(Author's Abstract)

I wish to bring before you a case presenting a striking group of clinical manifestations and a rather uncommon clinical course. The patient was under almost constant observation of competent neuropsychiatrists, so that the sequence of events was studied with great care and recorded in detail. Not without interest also is the fact

that the suggested diagnostic possibilities were many and varied. Among those considered were: general paresis, cerebral arteriosclerosis with multiple areas of softening, Wilson's disease with psychosis, atypical form of multiple sclerosis, extensive chronic encephalitis, and a frontal lobe neoplasm involving the right side of the brain.

J. B., a Russian, aged forty, married, was a skillful mason, a good earner, and a man of fair intellect. He had been a constant reader of books. His family history is negative. He was always well and was in good health directly preceding the time of onset of his present illness.

He was brought to the Neurologic Clinic of the O.P.D. of Mt. Sinai Hospital on April 25, 1925, and the following history was obtained: About one and one-half years prior to his admission to the clinic he awoke one morning complaining of intense headache and dizziness. Immediately following breakfast, he vomited, became confused, and failed to recognize people about him. His conduct became very peculiar and childish; he would cry without provocation, or he would become mute and refuse to talk; he would move about restlessly and aimlessly, kissing various objects about the house indiscriminately. He became very clumsy in all his movements. There were, however, no convulsive attacks, no loss of consciousness, no paralytic phenomena, and apparently no febrile state.

He remained at home for about two days, becoming progressively worse, and was taken to the psychopathic division of Bellevue Hospital for observation.

The observations there are recorded as follows: Patient is confused, childish, crying at times without good reason; speech is slow, slurring, answers are frequently irrelevant and incoherent. He is disoriented for time and place; memory is impaired for remote and recent events; judgment is poor, and there is no insight. Pupils are irregular but equal; both react sluggishly to light but promptly in accommodation. There is a coarse tremor of facial muscles, tongue and fingers. There are also twitchings of muscles of left extremities. Knee jerks are diminished; heart sounds are muffled; liver is enlarged; blood pressure is 165/100; and there is "evidence of marked arteriosclerosis." The fundi are negative. The cerebrospinal fluid is negative in all phases. The blood Wassermann is negative.

He remained at Bellevue for one month and nine days and was then committed to the Manhattan State Hospital without a definite diagnosis being offered except for the suggestion that marked arteriosclerosis was present.

While at Manhattan State Hospital, he was at first very restless, displaying twitchings of various muscles, face and hands; marked mental deterioration; laughed a good deal without reason, was childish in conduct and very untidy. He was confused, incoherent, disoriented and perseverated in his speech. He was helpless, and had to be assisted in dressing (very likely due to apraxic disorder). The neurologic status is recorded as follows: Parkinsonian facies; pupils equal but irregular, right pupil reacts promptly to light, left

is sluggish to light, both react promptly in accommodation; knee jerks are increased, left more than right; the abdominal reflexes are present; there is some resistance to passive movements; speech is dysarthric. An X-ray examination showed enlargement of the liver. The biologic tests of the blood and the cerebrospinal fluid were negative in all phases. He received no antiluetic treatment in his ten months' stay but showed gradual mental but no physical improvement. He was then placed in the care of his family. The diagnosis on discharge was psychosis with Wilson's disease.

Shortly after his return home he was seen by a neurologist who referred him to our clinic in the O.P.D. The findings on the first examination in the clinic were as follows: pupils irregular, unequal, right larger than left, both react sluggishly to light but well in accommodation. The eye movements could not be tested for lack of coöperation. The lower jaw is carried to the left on opening of the mouth. The face is fixed, with a washed-out expression, and shows asymmetry. Tongue deviates to left. The speech is dysarthric and monotonous. There is marked incoördination of movements with loss of associated movements in the upper extremities; generalized hypertonia; generalized hyperreflexia, more marked on the left side. All superficial reflexes are present. Bilateral Hoffman, but no other pathological reflexes. No sensory changes.

The mental examination which, for lack of coöperation, was limited, showed his memory to be intact. Spontaneous speech was partly intact. There was definite limitation in the choice of words. Speech was slurring and dysarthric. He repeated words spoken to him correctly. He understood commands spoken to him but could not carry them out correctly. He could not write spontaneously, and could not copy written letters, nor write on dictation. He perseverated in movements in attempts to carry out different commands. He imitated movements with occasional error.

The blood pressure was 210/90. Blood Wassermann reaction, four plus. At this time the diagnosis of an extensive chronic encephalitic process or right frontal lobe neoplasm was considered.

The patient remained under observation over a long period of time, and was examined repeatedly, little change being observed in his physical findings, while he continued to improve mentally. He received a short course of mixed treatment, probably not more than one decigram of mercury. Iodides were given for a somewhat longer period, and a course of sodium cacodylate injections was administered. A second blood Wassermann test in August, three months after the first examination, was reported negative.

His present status can be summed up briefly by saying that very slight change has occurred in the objective neurologic findings since the first examination, and that the outstanding features are: irregularity and inequality of pupils; spastic fixed and asymmetric facies; deviation of tongue to left; paresis of left upper extremity; tremors of outstretched hands more marked on left; tremor of head; generalized rigidity and generalized hyperreflexia, more marked on left side; active abdominal and cremasteric reflexes; bilateral Hoffman

sign; clumsy gait; somewhat slurring speech; manifestations of ideational apraxia in various fields including alexia, agraphia and akinetic apraxia in the paretic extremity; astereognosis without sensory disturbances.

A mental examination shows him to have gained ground in many intellectual fields. His memory, orientation, judgment, insight, coherency and relevancy of speech have markedly improved. Emotionally he is also more stable.

Two important facts stand out most prominently in the clinical picture presented: (1) The abrupt onset in a healthy individual of a stormy and extensive disease of the central nervous system, with the clinical manifestations of an acute dementia, characterized by psychomotor hyperactivity, emotional instability and rapid deterioration of intellect, in association with distinct organic neurologic disturbances in the nature of nuclear, extrapyramidal and pyramidal tract signs and symptoms; (2) The gradual upward progress in the condition of the patient leading to slight improvement in the physical status and fairly marked clearing of the psyche.

What are the extent and localization of the disease process, and what the character of the lesion?

The objective findings in the case unquestionably indicate a diffuse pathologic process which very likely did not spare much of any part of the brain substance. The marked intellectual disorder, the emotional disturbances, and the akinetic apraxia in the paretic arm place the disease process in the frontal lobe, while the definite evidence of ideational transcortical apraxia with alexia and agraphia indicate a diffuse and extensive lesion in which the parietal lobe plays an important rôle. The rigidity, tremors and myoclonic twitchings (which have been present in the early phase of the disease) incriminate the basal ganglia and the midbrain area, the latter very likely being responsible also for the ocular changes. The generalized hyperreflexia with paretic phenomena indicate of course mild pyramidal tract involvement. Now with such a widespread lesion what need is there and what hope for success can there be for circumscribing the disease process?

The other question, the nature of the pathologic process, is still a more difficult one, and can best be answered by an analysis of the diagnostic possibilities that were suggested.

General paresis was dismissed in the face of negative serologic findings and because of the abrupt onset of a very profound dementia without any prodromal symptoms and without any other earmarks of general paresis.

In favor of arteriosclerosis was, of course, the hypertension and the enlarged liver, but again the widespread character of the disease process, the lack of any tendency to focalization and the fact that the marked mental deterioration was way out of proportion to the physical signs, spoke strongly against such a pathologic process.

Wilson's disease with psychosis was based mainly on the pallidostriatal signs in association with the enlarged liver. The character of the tremor, the lack of constant progression in the face of a very

apparent remission, does not permit grouping the case with instances of progressive bilateral lenticular degeneration.

None of the signs typifying multiple sclerosis are present in this case.

There is a lack of evidence of intracranial pressure or any of the cardinal signs of cerebral neoplasm.

There are several features in this case common to Alzheimer's disease, such as the intellectual deterioration with disseminated and diffuse organic manifestations. But in Alzheimer's disease the onset is insidious at first, the disease process gaining momentum rapidly, and leading to a rapidly fatal issue without remissions.

For some time the patient has been regarded as a form of extensive chronic encephalitis. It is this diagnosis that I ask you to consider along with another diagnostic possibility, the spastic pseudosclerosis of Strümpel. The latter was recently briefly described by Jacob who in his article on extrapyramidal system disease says: "I have also described '*spastische pseudosclerosis,*' peculiar types of cases in middle age, without clear etiology, with remissions, rapid progress, and the following cardinal symptoms: beginning with anxieties, mild confusions and mild extrapyramidal symptoms, then gradually increasing in severity to a Korsakoff syndrome, with delirium, anxiety, confusion and optic and acoustic hallucinations. Besides these cortical symptoms, there are pyramidal tract symptoms, such as absence of abdominal reflexes, and occasional Babinski and Oppenheim signs, but no marked paralysis. Of special note are the extrapyramidal symptoms in the form of tremor and shaking, increased tension in the extremities, akinesis, dysarthria, astasia abasia, and frequently marked pains."

There is a very striking parallelism between this clinical picture and that presented by my patient. And, of course, while this case may indeed belong to this group of spastic pseudosclerosis, I would, however, not like to be forced to discard the diagnosis of diffuse subchronic encephalitis; for can anyone tell during the life of a patient whether a given diffuse process is degenerative in character, as in pseudosclerosis, or inflammatory in nature, as in encephalitis? This can only be determined in the course of time.

DIATHERMIA IN THE TREATMENT OF MULTIPLE SCLEROSIS

Junius W. Stephenson, M.D.

(*Author's Abstract*)

Two cases of multiple sclerosis were described, which showed improvement with diathermia. The cases were of the spinal type and both showed sensory changes revealing a spinal level. The cases showed typical multiple sclerosis findings, such as diplopia, nystagmus, pallor of the optic disc, loss of abdominal reflexes with spasticity. One case was a young woman, twenty-five years old, whose symptoms

dated about two years. This case showed a Brown-Sequard syndrome with the pain and temperature level on the left side at the sixth dorsal vertebra gradually shading up to the seventh cervical where it was within normal limits. The sense of position in the right toes was completely lost. The second case was a man, fifty years old, an advanced case of at least eighteen years' duration. He showed a bilateral sensory level at the eighth cervical with loss of position sense in all toes. Vibratory sense in this case was much reduced. In the first case manometric test showed a distinct block, whereas in the second there was no evidence of block. A pad eight inches long and two and a half inches wide was devised and in the first case was applied from the seventh cervical down and in the second from the fifth cervical down. In both cases 800 milliamperes for a period of twenty minutes was the first application. Whereas before the treatment neither case could recognize the position of toes, twenty-four hours after treatment the first case made correct answer in 50 per cent of the test, and three days later a perfect response. At the same time there was a distinct diminution of the pain and temperature impairment which in the course of ten days had entirely disappeared. In the second case, twenty-four hours after the treatment, the patient made only one mistake in the position of his toes, and forty-eight hours later, none. In this case the sensory level, in the same period of time, dropped from the eighth cervical to the ninth dorsal. The first case has been kept under close observation. There has been a progressive improvement in her power of locomotion until six weeks after the first treatment she went for treatment alone, in the course of her journey having to climb elevated and subway stairs. Before treatment she could not walk alone. Also it was noted the first bedside note as to her improvement was made three days after the first treatment. For four months the treatment was given three times a week. There was a gradual increase in the dosage until she was receiving 1400 milliamperes for a period of twenty minute exposure. Five months after treatment she could walk a straight line, did not sway with the eyes closed, finger nose and knee to heel test perfect. All the abdominals had returned except the right lower. However, those returned were exhaustible. She still showed a suspicious Babinski, though there was no suggestion of the previous inexhaustible ankle clonus. No brief was held for the results of the treatment, but Dr. Stephenson felt that inasmuch as in the two cases there was the identical behavior in the sensory findings occurring within the same interval of time, that this was not a coincidence nor remission, but an actual result of the therapy and justified further investigation. He felt that case one showing a distinct block proved there must have been some swelling of the cord, and that this was most probably of an inflammatory nature, and not degenerative, and that the effect of the heat of the diathermia produced an increased vascular supply, thereby increasing the protective forces at this particular lesion. He felt that the prompt response observed in the sensory fields was due to the fact that such sensory changes are not so common, meaning that these tracts are

less vulnerably attacked and therefore respond more promptly. He quoted Oppenheim as saying that in the majority of cases of multiple sclerosis, if the cases are sufficiently closely observed, sensory findings, though fleeting, can be demonstrated, and he felt that we should put forth more effort to find such changes and apply treatment accordingly.

Discussion: Dr. Joseph H. Globus said: I think Dr. Salan covered the ground so well that very little room is left for further discussion. Apparently the patient continues to improve, for there is little of the head tremor left, and the tongue deviates but slightly. He demonstrates almost every form of apraxia: motor, akinetic, ideational, etc., which must be regarded as evidence in favor of a diffuse lesion, most likely inflammatory in character, with secondary degenerative changes. Of the latter, of course, one cannot be certain.

Dr. Jelliffe said: I have one word to say, now that Dr. Stragnell has given me an opportunity, about a behavior disorder quite frequent in doctors. It is a pernicious disorder. If I may speak from my observation at medical meetings, it consists in a devotion to "names" of things, rather than the "behavior" of things. We have heard about "multiple sclerosis" and the treatment of "multiple sclerosis" by diathermia. Of course bacteriology came in as a blessing, but it also came in as a curse, because from bacteriological deductions our conceptions of diseases took on very definite aspects. Thus there was "scarlet fever," "measles," "smallpox" and "syphilis,"—clean-cut conceptions of which may be said to constitute "diseases," but, on the other hand, the extension of this conception beyond its legitimate rôle constitutes the behavior disorder of the doctors of which I speak. There is no such *thing* as "multiple sclerosis" in the same sense that we speak of a thing like measles. It is not a disease process *per se*. Multiple sclerosis pictures are produced in encephalitis; from tumors; from blood diseases; from syphilis, and from a number of other things. At least fifteen or twenty conditions are to be found in the literature which show the multiple sclerosis picture. There are fifteen or twenty types of processes which result in disseminated blocking of certain neurones. What has diathermia done for the particular form under consideration—not for the fiction "multiple sclerosis"? That is a very legitimate inquiry, and I think Dr. Stephenson has brought up a very important point. Lhermitte preceded him in the treatment of these so-called multiple sclerosis syndromes, as well as in syringomyelic process by X-ray and diathermic methods. It it a very important thing in these syndromes, for which practically nothing is being done to get some idea of the relationship between the action of what diatherma may be supposed to do and the type of lesion which may be supposed to produce such blockings in the functional pathways of the spinal cord. In that sense Dr. Stephenson has brought us something worth thinking about, and he has also suggested the possibility of the type of pathological lesion in one of the cases. I feel a little suspicious regarding the interpretation of the action of diathermia in a chronic progressive process which has been going

on for a number of years, when improvement begins within twenty-four hours.

As to the other case, that of Dr. Salan, I have not very much to offer, except along the same line. An encephalitic process can result in a multiple variety of mosaic-like pictures, as the bursting of a shrapnel shell, as Marie once said of the action of the encephalitic virus. It spreads all through the brain and the basal ganglia and the medulla, and gives rise to a multiple series of syndromes. Were there any tests of liver function done, the hemoclastic crisis, for example?

Dr. Salan replied: No.

Dr. Jelliffe said: The liver picture and the arteriosclerotic picture are of a great deal of interest. I have spoken frequently of the relationship between the vegetative syndromes, the involvement of certain synaptic junctions in the upper reflex arcs as they are integrated in vegetative functions. That is so in Wilson's disease. When I read his paper I wrote to him and said: "Here is a great opportunity to learn something about the vegetative nervous control of liver function." He never could see the point. He wanted to assume that the liver toxin produces a localized lesion in the basal ganglia, which may be so, just as CO poisoning has a localizing predilection for related structures. I wanted him to look at the problem from the standpoint of the interruption of the integration of the body as a whole, whereby pathways coming through the basal ganglia in the region of the third ventricle, and in the mesencephalic region were interrupted, and that such interruptions can produce diseases of the viscera, such as arteriosclerosis and changes in the liver, diabetes, etc. This viewpoint has now been abundantly proven.

Dr. Hyslop said: Dr. Globus was speaking of the varieties of apraxia. I question whether or not one can really call that case a true apraxia. The demonstration by the patient himself was too good for what one occasionally sees as the sort of apraxia that is the so-called classical form.

Dr. Globus: I would like to say a few words in reply to remarks made by Dr. Hyslop. He said that an idiot is not a proper subject to carry out such tests on.

Dr. Hyslop replied: I think we can demonstrate the same sort of disturbance in an idiot.

Dr. Globus said: In apraxia, the subject who displays such disturbance must necessarily understand the act he is to carry out. Whether he is an idiot or whether he is a genius it does not matter. An idiot may light a cigarette well, while a genius may fail to do so, if the latter has some form of apraxia. The important thing is that the individual examined must comprehend the act he is asked to carry through. This patient does understand it; he is not an idiot, nor, of course, a genius. He is capable of carrying out only some very simple acts.

I cannot fully agree with something Dr. Jelliffe has said. I must confess that I am an organic neurologist and cannot see how the other extreme of neurology can undertake to solve with their methods

some of the problems which are put to the organic neurologist, as for example, the localization of cerebral tumors, where he is to depend mainly on localizing signs, and must accept as a working hypothesis the belief that certain parts of the brain carry out certain functions independent of other portions of the brain. Particularly we must be allowed to speak of neurones, if the other group of neurologists continue to speak of synapses so loosely.

Dr. Jelliffe said: You assume that there is such a *thing* as a center.

Dr. Globus replied: Yes, there is such a thing as a center, if we regard the latter as a circumscribed group of nerve cells subserving a common function.

Dr. Clark said: I had supposed, inasmuch as the school of psychology had given up a special and distinct faculty formation of the mind, that the neurologists had long since discarded the strict brain localization also, and that one possessed no more logic or good physiology than the other. Many of the men will remember last year Franz's review of the strict localization hypothesis of brain function and his indication that it was no longer a tenable one; while in the main it was still to be used for diagnostic purposes, the brain acting as a whole in all of its special function was really the important principle to be borne in mind. Dr. Globus' statement therefore that there is a hard and fast rule in regard to the neurone conception being a more sure comprehension of physioanatomic methods of understanding brain function has really no better substantiation than a synaptic theory or the psychoanalytic conception of the libido formation of the whole nervous system. They are but different ways of thinking and understanding the anatomical and functional aspects of the nervous system in the living organism of the individual. We must be very careful, however, not to mix our categories as both have their validity, and the question is, which is the more useful in our understanding special disease process.

Dr. Globus replied: I must take exception to the statement of Dr. Clark and insist on the usefulness of the neurone idea. We are constantly meeting problems demanding the determination of whether an upper or lower neurone is involved in the disease process. In such instances the conception of the neurone theory is absolutely indispensable. Upon the latter we must often fall back, as, for instance, when we wish to determine the seat of a lesion causing various forms of paralysis, flaccid or spastic.

Dr. Jelliffe said: Nobody denies that; there is no controversy there. Dr. Globus says that in peripheral paralysis a spinal cord center is involved. In hysterical peripheral paralysis where is the cord center? Nobody denies the value of the conception of what are called centers. I think the conception of what are called "synaptic foci" is better than "centers." I think Dr. Clark has pointed out the availability of a possible hypothesis that will explain the situation. Sticking too closely to the conception of neuronic centers we are lost the minute we discuss an hysterical paralysis from an anterior poliomyelitis paralysis, except in so far in the one the reflexes are

not gone, and in the other they are gone. Dr. Globus says he is a pure neurologist. If he likes centers, I hope he will buy von Economo's latest atlas so he can see how complicated they are.

Dr. Stephenson (closing) said: I have nothing to add except in reply to Dr. Jelliffe's apparent criticism of my veracity. The marked improvement within the twenty-four hours was in the sensory findings and not the motor, and as I stated I thought that might be explained on the theory that sensory findings to the degree here shown are not common, which means that these tracts are less vulnerably attacked and in consequence respond more promptly to therapy. I am sure in his large experience Dr. Jelliffe has seen just such changes, not only in multiple sclerosis, but in syringomyelia follow an ordinary lumbar puncture.

Current Literature

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Covey, G. N. Pemphigus Vulgaris and Spinal Cord. [Arch. Derm. & Syphilology, March, 1924; J. A. M. A.]

Certain symptoms and findings in a case reported by Covey suggest a chronic low grade infection. Other observations seem to point to possible lesions in the spinal cord, the dorsal roots or their ganglions as the seat of trouble, the skin lesions being merely a manifestation of trophic disturbance in this tissue as a result of the nerve lesions. Definite gross and microscopic lesions were readily demonstrable in the predicted areas at postmortem examination. The case described presented findings in the spinal cord and dorsal roots that have not been described before. These lesions are in such a location and of such character that their possible rôle in the production of the visible lesions of this disease is perfectly evident to Covey.

Rollier, A. Prophylactic and Curative Action of Sunlight. [Médecine, June, 1924; J. A. M. A.]

Rollier insists that air and sunlight are the natural medium for the entire body. The biologic value of the pigment is being confirmed more and more. He is inclined to regard it as a transforming mechanism, like that of certain fluorescent substances which transform rays with short waves into longer and more penetrating waves. The pigment probably receives, furnishes and activates the elements essential for the metabolism of hormones. The sun bath by dilating the capillaries activates the circulation, and the vibratory shock of the sun's rays may induce a continuous tonic action on the sensory nerve terminals in the skin, thus restoring tone to the muscles and promoting physiologic processes throughout the body, including recalcification of the bones. This property of sunlight, to which he called attention long ago, in his earliest studies of the subject, has been brilliantly confirmed by the recent works on the curative influence of sunlight in rickets. He accepts as plausible that the light absorved by the blood makes it a reservoir of radiant energy which activates the intracellular oxidation and reduction processes. The local action of whole sun baths is microbicidal, analgesic and sclerosis and reduction promoting, while the general action is to stimulate to the utmost the entire vital activity. On the basis of 15,000 to 16,000 roentgenograms, he affirms that no closed bone lesion, whatever its location, its depth or

its gravity, escapes the curative action of the sun. The main principle in treatment should be to allow free access to the sun and avoid everything liable to interfere with muscle functioning. Occlusive plaster casts sin against both these principles. In his 300 cases of tuberculous peritonitis, he never had to resort to laparotomy. The multiple manifestations of what used to be called surgical tuberculosis are the main field for heliotherapy, but the "solar dressing" is applicable to wounds and traumatisms of all kinds. In burns with vast ulceration the soothing and healing effect was particularly manifest. He urges arrangements for sun and air baths in all schools, public and private, in orphan asylums, barracks, and in general in the cities.

Asher, L. A Non-Fatigability of the Voluntary Muscle and Its Autonomic Innervation. [Schweiz. med. Wschr., Nos. 17, 18, Vol. 53.]

Asher has utilized a method of investigation for the study of fatigability which preserves physiological conditions as far as possible. He shows in the rabbit that when he uses a tetanus-producing stimulus in a definite frequency a relatively long period of non-fatigability, 4-6 hours, follows a comparatively brief period of initial fatigue. Even when 600–700 g. were put upon the M. gastrocnemius a prolonged relative non-fatigability could be demonstrated. This nonfatigability could be made evident again when the curve fell with a prolonged tetanic contraction by returning to a rhythmic frequency of the tetanus about every third second. Asher concludes that the musculature has an astonishing capacity for resistance under physiological stimulation. An essential increase in nonfatigability was evident in cold-blooded forms—frog—upon warming the animal, probably due to acceleration of the course of the processes of restitution and the favorable influence upon diffusion of the products of metabolism. It appears thus that fatigability of muscle in man has its location in the central nervous system, a fact to which as well as to the impulse given there more attention should be paid. Experiment showed the same nonfatigability in animals in which all the sympathetic nerves of the extremities were removed while the cerebrospinal motor nerves were spared. Section of the posterior roots with complete destruction of sensibility caused fatigue to appear later. Azetylcholin, a parasympathetic stimulating toxin, produced the same effect.

Ganter, G. Reaction of Nonstriated Muscles. [Münch. med. Woch., Vol. 71, Feb. 15. J. A. M. A.]

Ganter observed the vascular reactions in the intestine of a patient with cecal fistula and in the duodenum of healthy subjects. He found that the assumed compensatory play between the skin and the intestine is not the rule. Both systems react in the same way to vagotonic and sympathicotonic drugs. The vagus increases the tonus of the muscles of

the intestine and decreases the tonus of the vascular muscles, while the sympathetic acts the reverse of this. All the nonstriated muscles, while the sympathetic acts the reverse of this. All the nonstriated muscles of both the intestine and the vessels react to morphin (increase of the tonus) and to senna (decrease). These drugs act probably directly on the nonstriated muscle, or at least peripherally from the point of action of atropin and pilocarpin. The active principle of senna is a glycosid, and the action of digitalis on the heart consists also in a decrease of the tonus of the heart muscle, without decrease of the excitability. The action of strophanthus injections on the intestine resembled that of senna, and a patient with heart insufficiency was relieved by senna. This drug acted also favorably in asthma, and in uremia with convulsions. He objects to Eppinger and Hess' theory, that it is difficult to explain the low blood content of the skin in their vagotonia. He prefers to distinguish between anatonia (increased tonus of all the nonstriated muscles), which is not always identical with vagotonia and apotonia (decreased tonus). The first group includes asthma (bronchial, cardiac and renal), spastic constipation, nephritis, and insufficiency (not weakness) of the heart. The patients are usually pale except some with a very good blood supply ("red hypertension"). The second group—apotonia—comprises infectious diseases, especially tuberculosis, diabetes, exophthalmic goiter, nephroses, anemia and cachexia. The patients in this group have a ruddy complexion, unless the disease is too far advanced. Insulin belongs in this respect to the morphin group (increase of the tonus).

Dart, Raymond A. Some Notes on the Double Innervations of Mesodermal Muscle. (Jl. Comparative Neurology, Vol. 38, April 15.)

1. The double innervation (somatic and sympathetic) of mesodermal (striated) muscle is vindicated by all lines of inquiry—anatomical, physiological, clinical, and experimental.

2. Being doubly innervated, mesodermal muscle is shown to be different from, and yet derived from dermal (unstriated) muscle which has but a single innervation (sympathetic).

3. Both the ectoderm and the mesoderm (as here defined) are segmented completely. They form a physiological entity, while the endoderm is not so segmented. The doubly innervated mesodermal muscle is therefore of ectodermal origin.

4. The sympathetic nerves in mesodermal muscle are of two types (motor and sensory).

5. The intrafusal muscle fibers of muscle spindles also are always doubly innervated, one of the nerve fibers being the coarsely myelinated somatic sensory nerve fiber, the other being a finely myelinated sympathetic motor nerve fiber.

6. A new conception of the physiology of mesodermal muscle is thereby introduced; the relation of this conception to several physiologi-

cal and clinical phenomena is briefly discussed, more especially the phenomenon of muscle tonus, which is fundamentally sympathetic in its origin.

7. The double innervation of mesodermal muscle is only part of the phylogenetic issue of much wider application.

8. Since the segmented (central or somatic) nervous apparatus is demonstrably more recent phylogenetically, it follows that the unsegmented (vegetative or sympathetic) nervous apparatus could not possibly have been derived from the segmented system phylogenetically, nor does it so arise ontogentically. [J.]

Michael, J. C. Infantile Progressive Muscular Atrophy of Werdnig-Hoffman Type. [Am. Archives of Neurology and Psychiatry, IX, No. 5, p. 582.]

This infant, two months old, presented this syndrome and died of pneumonia at the age of five months. At necropsy, the muscles were pale and soft and of fibrous appearance and consistency. Histologically, they showed small muscle fibers, fetal in type rather than degenerated, with increase of connective tissue about some individual fibers, and a relative increase of connective tissue throughout the whole area. Sections of the spinal cord showed a marked reduction in the number and size of the ventral horn cells. The latter showed signs of chronic degeneration, and the chromophil substance was closely packed. The cells in the dorsal horns were normal. The ventral roots, within the white matter of the cord as well as outside of the cord substance, showed, by Weigert's method, marked diminution of myelin. The contrast between these and the normally stained dorsal roots was quite pronounced. Cross sections from the brachial plexus and from the sciatic nerve showed many nerve bundles devoid of myelin.

Stattmüller, K. Thomsen's Disease. [Ztschr. f. d. ges. Neur. u. Psych., Vol. 81, Nos. 1, 2.]

Report of a woman and her four grown children and four grandchildren from two of the diseased children who showed symptoms of Thomsen's disease in the form of paradoxic myotonia which plainly afforded a strikingly good prognosis and appeared chiefly only about the period of puberty, although remnants of the disturbances were still demonstrable later in individual members of the family.

Gôrriz, M. On a Perinuclear Spiral Filament of Striped Muscle-Fibers. [Trab. d. lab. invest. biol., 19, 233. Med. Sc.]

In striped muscle-fibers of vertebrates a perinuclear spiral filament can be shown by Cajal's uranium nitrate method. The filament is analogous to that described by Del Río-Hortega in plain muscle-fibers, but is different from the chromatin spirals described by van Gehuchten in the nuclei of amphibian muscles. The perinuclear spiral filament has

probably a protecting function in so far as it can prevent an excessive deformation of the nuclei during muscular contraction.

Henner, K. Atrophic Myotonia. [Cas. lek. Cesk., Feb. 23, 1924.]

Henner reports the history of a patient, aged sixty-eight, with increased tonus of muscles, combined with atrophy, evidently of neuropathic origin. A bulbar syndrome and symptoms of an affection of the central neurons complete the peculiar clinical picture.

Vedsmand. Myasthenia Gravis in Exophthalmic Goiter. [Uges. f. Laeg., June 7, 1923.]

A healthy woman, at the age of forty-one developed headache, a sensation of oppression in the heart region and increasing nervousness with the clinical picture of exophthalmic goiter after two years and then four years later myasthenia gravis developed, progressing to a fatal termina tion two years later. The blood pressure fluctuated from 140 to 175 mm. during the last few months. The sugar content of the blood responded normally to epinephrin tests. The condition grew rapidly worse under suprarenal extract treatment.

Auricchio, L. Primary Progressive Myopathy. [La Pediatria, XXX, No. 11.]

The author describes four cases of primary progressive myopathy, pseudohypertrophic in form, observed in four uterine brothers who presented different stages of the disease. Interesting data were obtained from anamnestic investigation on the mother's side; two brothers of the mother who died of intercurrent disease at an early age were affected with a similar paralytic disorder. This fact leads one tc think that the primary myopathies belong in the field of certain congenital malformations which are transmitted chiefly to the males crossing the female without injury (hemophilia). The coexistence of syphilitic infection in the four patients and the mother, ascertained by the Wassermann reaction, the mother showing morphologic alteration of the thyroid, leads the author to believe that the "primum movens" of this serious organic affection of the muscular system should be sought in syphilitic infection whether the latter is to be considered as a direct cause or an indirect cause through endocrinous dysfunction.

Adie, W. J. and Greenfield, J. G. Dystrophia Myotonica (Myotonia Atrophica.) [Brain, Vol. 46, May.]

Dystrophia myotonica is a disease sui generis within the group of heredofamilial degenerative disorders. It forms a link between other well-known members of this group in that two of its cardinal symptoms—myotonia and muscular atrophy—are identical in nature with the same symptoms in Thomsen's disease and the familial muscular dystrophies respectively. At the same time it introduces a new kind of disorder into

this group of diseases, in the form of certain degenerative phenomena in parts outside the muscular and nervous systems.

The fully developed disease is confined in the main to one generation —the dystrophic generation as they have called it—where it occurs in some members of a number of families of the same child-rank in relation to a common ancestor.

The members of preceding generations do not suffer as a rule from myotonia or muscular atrophy, but they often develop cataract which appears at an earlier age in succeeding generations, and genealogical investigations reveal evidence of progressive deterioration in some branches of the stock.

In the dystrophic generation itself some members remain healthy, some may have cataract alone, some may suffer from the disease in an incomplete form—one of the cardinal symptoms, say muscular atrophy, being absent; while others present the combination of muscular atrophy and myotonia with certain extramuscular symptoms for which the name dystrophia myotonica has hitherto been reserved. The authors here show very clearly that a majority of the latter conform to the classical descriptions of Batten, Steinert, and Curschmann, but a consideration of the foregoing statements shows that these descriptions apply to a type only—to a syndrome which is merely one aspect of an heredofamilial disease with diverse manifestations.

The disease in all its aspects then remains undesignated, but this discrepancy will be removed if the name dystrophia myotonica is transferred to the disease itself from the syndrome to which it is at present applied. For the syndrome, which also requires a distinctive appellation, "dystrophia myotonica, type Batten-Steinert-Curschmann," would suffice.

Rohr, F. Progressive Dystrophy of Muscles. [Med. Klin., June 30, Vol. 19. J. A. M. A.]

Rohr reports a case in a boy, aged nine, in which endocrine insufficiency was evidently a factor. Under careful organ extract treatment, the child made rapid progress. Rohr lists the various symptoms which presumably indicate participation of the different endocrine glands, as a guide to treatment.

Spiegel, E. A. Physiology and Pathology of the Skeletal Muscle Tonus. [Zschr. f. d. ges. Neur. u. Psych., LXXXI, Nos. 3–5.]

Spiegel has obtained valuable results by his own investigations in this field which he discusses in a comprehensive work upon the tonus of the skeletal muscles. He states among other things that it has not been demonstrated thus far that the static innervation is brought about through fibers independent of the motor terminations. Proof is not yet made that the sympathetic fibers or the efferent posterior root fibers innervate the tonus. Apparently the axons of the anterior horn cells perform this

function. Probably there is only a quantitative not a qualitative difference between the cessation of the tonus and the kinetic contraction. That which Rieger calls the "braking" of the tonus depends upon a proprioceptive reflex of which the efferent branch runs extrapyramidally but only in part over the cerebellum.

2. ENDOCRINOPATHIES.

Allen, F. M. Internal Pancreatic Function of Thyroid and Diabetes. [Journal of Metabolic Research, I, No. 5, p. 619.]

From this experimental study Allen draws the inference that certain types of hyperthyroid activity may aggravate the symptoms of an existing diabetes. That such may de novo cause a diabetes he denies. He also doubts any antagonistic interrelationships between the pancreas and thyroid. The general trend of the paper is to overaccentuate the autonomy of a single organ—the pancreas.

Friedman, G. A. and Gottesman, J. Studies on the Relation of the Thyroid to Pancreatic Diabetes in Dogs: with Suggestions as to Diabetes Mellitus in Man. [J. A. M. A., Vol. 80, Oct. 7.]

These authors summarize their work as follows: Diabetes mellitus is primarily a disease of the insular apparatus of the pancreas, with an actual pathologic condition in severe cases. The low sugar tolerance in all cases of hyperthyroidism suggests that the islands of Langerhans in this disease are always functionally affected, and that, occasionally, histologic changes in them may occur in those rare cases in which exophthalmic goiter and diabetes mellitus are combined. Since overactivity of the thyroid caused by pathologic alteration in the gland upsets the pancreatic islets, a pathologic condition of the latter may functionally affect the thyroid. The fact that true myxedematous individuals are not liable to become diabetic, and that a spontaneous cure from diabetes mellitus may occur through hypoplasia of the thyroid, brought about by various unknown causes, is highly suggestive that complete removal of the thyroid in man might have a curative effect for the malady. That the removal must be a complete one becomes evident from clinical observations that subthyroidism and diabetes are found combined in the same individual. The association of hyperglycemia with a tendency to obesity, in depancreatized nonglycosuric dogs after incomplete pancreatectomy, resembles the prediabetic state in man, *i.e.*, hyperglycemia and increase in body weight. Depancreatized glycosuric dogs become sugar free after complete ligation of the thyroid arteries or after thyroidectomy, preceded by partial ligation of the vessels, provided tetany or infection does not occur. Partial ligation of the thyroid vessels or one-sided lobectomy has

no effect in checking the glycosuria or the hyperglycemia. From some considerations given in this discussion, it is probable that thyroidectomy in two sittings may be even more effective in human diabetes than in depancreatized dogs. It is therefore suggested that complete thyroidectomy should be tried in the diabetes of children and in severe diabetes of adults who do not respond to the modern treatment.

Banting, F. G. et al. Insulin in Rabbits. [Am. Jl. of Physiology, LXII, No. 1, p. 162.]

This is one of the earlier papers of these investigators on rabbits. They show that insulin, when injected subcutaneously into rabbits within a few hours causes the percentage of sugar in the blood to fall. For the physiologic assay of pancreatic extract, the authors consider as one unit the number of cubic centimeters which causes the blood sugar of normal rabbits to fall to 0.045 per cent within four hours. This dose is decidedly active in lowering the blood sugar in diabetic patients. As the blood sugar falls, as a result of pancreatic extract injections, the rabbit exhibits highly characteristic symptoms, the earliest of which are signs of hunger and thirst, hyperexcitability and apparent fear. The animal may recover from these earlier symptoms but frequently, with active preparations, the hyperexcitability becomes extreme and clonic convulsive seizures involving the entire body and lasting for several minutes supervene. Between the convulsive seizures the animal is lying on its side in a more or less comatose condition with shallow, rapid and frequently periodic breathing. In the great majority of cases exhibiting convulsion the blood sugar has been found to be about 0.045 per cent.

Pérez, M. L. Diabetes During Pregnancy. [Sem. Méd., Aug. 24, II, No. 34.]

The clinical record of a case of diabetes in a fat woman developing in her second pregnancy. The child was born cyanotic and died in thirty minutes. The diabetes subsided during the puerperium. Widal's hemoclastic test was positive.

Marañon, G. Blood Pressure in Diabetes. [Zentralblatt für innere Med., XLIII, No. 10, p. 169.]

High blood pressure and diabetes are related in some obscure manner, but this relationship is of much import. Ninety recently observed cases of diabetes showed that when the dsease occurred at a more advanced age arterial hypertonia was more common and more intense. Does this express a causal relation or is it fortuitous? Healthy persons forty years old and upward show a constant increase of blood pressure. If the course of the arterial pressure and the diabetes in these cases is observed, it appears that in a number of patients a period of arterial hypertonia is present before the glycosuria and other clinical signs of diabetes appear.

When glycosuria finally appears, it often happens that the hypertonia continues for several years and then decreases. Marañon observed in his 90 cases that the high blood pressure decreased in proportion as the patient got farther away from the clinical onset of the diabetes. Certain cases of hypertonia without glycosuria develop later into genuine diabetes. Among those who, at about the age of forty, begin to show signs of high blood pressure, there are a few in whom the development of a diabetic condition seems likely. In these there will be a more or less marked increase of blood sugar, a decrease of the carbohydrate tolerance, intense circulatory and nervous reaction to injection of epinephrin, and in certain cases the appearance of signs of a diabetic diathesis.

Hoffman, F. L. Mortality from Diabetes. [Boston Medical and Surgical Journal, CLXXXVII, No. 4, p. 135. J. A. M. A.]

Hoffman presents the results of a study of the mortality from diabetes in foreign countries. The range in relative frequency is extraordinary, reaching a maximum of 38.4 per 100,000 of population in the Island of Malta, 18.1 for the Isle of Man, and 16.1 for the Island of Jamaica, 1.1 for the Bahamas, and 1.0 for Venezuela. The average diabetes death rate for the United States registration area is 16.4 per 100,000 of population. The American death rate is decidedly above the normal average of 11.8 for England and Wales, and while unquestionably somewhat affected by the relatively large Jewish population in the large cities, this factor cannot be considered as primarily responsible for the marked excess. The normal diabetic death rate of New York City for the five years ending with 1919 was 19.8 per 100,000 of population, or higher that the maximum rate reported for the city of Berlin, 17.9 per 100,000; or for Copenhagen, Denmark, for which the rate is 17.1; but for Amsterdam, Holland, the rate is 15.9. The minimum rates are reported for Tokio, Japan, or 4.1; for Singapore, or 4.3; for Manila, P. I., or 4.5; and for the City of Mexico, or 5.4. For a few of the cities for which the information is available the following rates, according to sex, at ages twenty and over, are of interest: Berlin, Germany, males 31.4 and females 20.8 per 100,000; Copenhagen, Denmark, males 28.1 and females 20.9; Florence, Italy, males 27.1 and females 14.5; Christiania, Norway, males 24.4 and females 14.5; Victoria, B. C., males 12.0 and females 15.3; Montevideo, Uruguay, males 13.7 and females 25.9; London, England, males 16.8 and females 14.8; and Singapore, Straits Settlement, males 5.5 and females 6.7.

Higgins. Determination of Acetone in Breath. [Johns Hopkins Hosp. Bull., 31, No. 358.]

This is a new technic for tests of the grade of acidosis. It is a chemical method of estimating the acetone in the breath thus learning if acetone bodies are present in the body and roughly in what amounts. It is of service in cases of hyperpnea, when acidosis is recognized or suspected. In diabetic patients it provides a rapid quantitative measure-

ment. In cases in which a patient has been getting little or no food, as in fasting or recurrent vomiting, the determinations of the acetone in the breath act as a guide to the patient's condition. The air is collected in a rubber bag of 1,000 c.c. capacity. It is blown within half a minute through the Scott-Wilson acetone reagent. The white precipitate after five minutes is checked up by scale and the percentage of acetone calculated.

Underhill, F. P., Tilestone, W., and Bogert, J. METABOLISM STUDIES IN TETANY. [Jl. Metabol. Res., 1, 723. Med. Sc.]

Very complete metabolism experiments, especially with regard to calcium, in a fatal case of tetany of intestinal origin. The results were compared with those obtained at the same time on a male and a female subject. There appears to be a much greater tendency for calcium storage in a tetany case than in normal subjects. Very little calcium is eliminated by way of the urine either on a calcium-poor or calcium-rich diet, and change in the calcium intake affects very little, if at all, the amount of calcium excreted by the kidney. In spite of diarrhea and progressive loss of weight the patient was in positive nitrogen balance and the utilization of protein was excellent. Fat utilization was poor. An attempt to isolate guanidine from the urine failed.

Iwabuchi, T. SUDDEN DEATH IN TETANY. [Zeits. f. Kinderh., XXXIII, Nos. 3–4.]

In this pathological study the author found definite evidences of inflammatory edema in the structures of the medulla of an infant six months old, which had died after several tetany attacks.

Klemperer, P. PARATHYROID HYPERPLASIA AND BONE DESTRUCTION IN GENERALIZED CARCINOMATOSIS. [Surg. Gyn. & Obs., XXXVI, No. 1. J. A. M. A.]

In this case removal of both mammary glands for cancer was followed six months later by pains in the back. On physical examination, she complained of pain over most body structures, especially in the spinal region. The roentgen-ray examination showed multiple cancer metastases in the whole skeleton. At the necropsy, numerous tumor nodes were found in both lungs. The most significant condition, however, was the state of the skeleton. The spine in its whole extent could be cut easily with the cartilage knife; in the right femur large and small nodules, narrowed the cortical substance, while they destroyed the spongy substance of the bone in the epiphysis. There were also metastases in the cranial and sternal bones. The extensive destruction of bone tissue led to an examination of the parathyroid glands. On dissection three were found in normal places; they seemed to be unaltered in size. In the place of the left inferior parathyroid was an oblong, kidney-shaped body 30 by 5 by 3 mm. in size, entirely separated from the thyroid gland. It was

yellow in color, and dense in consistency. The histologic picture of the bone metastases revealed not only an extensive bone destruction but also a noticeable new formation of osteoid tissue.

Niderehe, W. Tetania Gravidarum. [Arch. f. Gyn., CXVI, No. 2.]

In this clinical and bibliographic study of 70 cases fatal convulsions in the infants occurred in the first weeks in 12 cases; abortion occurred in 3; the fetus was macerated in 4, and there was spontaneous or induced premature delivery in 4 and in 2, respectively. A personal case report showed that tetany developed for the first time during the fifth pregnancy and returned at the sixth and seventh pregnancies, growing progressively more intense. At the last delivery the child showed a combination of tetany and a disturbance in bone growth which resembled a congenital rachitis. The thymus and the parathyroid glands seemed to be deficient.

Landauer, K. The Tetanoid. Clinical Study of a Neuropsychiatric Syndrome. [Arch. f. Psych. u. Nervkr., LXVI, Nos. 3, 4.]

Landauer regards the tetanoid only as a symptom complex, a special form of overstimulability. It is due not only to disturbance of the parathyroid glands but also to brain disease and it represents the somatic accompaniment of sadness and anxiety. The pathognomonic symptoms are often combined with others which therefore are known as tetanoid in contrast to tetanic. Beside the typical convulsion with Trousseau's phenomenon there may be in psychogenic and cerebral diseases a cataleptic form. Another form has been seen, temporarily designated epilotetanoid. It is a peculiar form which combines loss of the Chvostek reaction, lack of response to calcium therapy, epileptoid symptoms and other peculiarities in nature and course. The symptom complex is not a single one. The effect of calcium and the failure of scopolamin were frequently represented in the absence of the Trousseau and Erb signs. The tetanoid reaction could not be proved to be due to constitution, to spasmophilia or to rachitis.

Gross, E. G. and Underhill, F. P. The Metabolism of Inorganic Salts. I. The Organic Ion Balance of the Blood in Parathyroid Tetany. [J. Biol. Chem., LIV, No. 105. Med. Sc.]

The injection of dibasic sodium phosphate into dogs gave the following changes in the serum, namely, a reduction of the calcium, an increase of the inorganic phosphorus, and in one case a slight alkaline change of the reaction. The injection of phosphoric acid was followed by the same changes in the calcium and phosphorus, but there was a decided reduction in the sodium and the CO_2 combining power of the serum, as well as a definite increase in its acidity. These facts are against the view that the calcium-phosphorus ratio has any influence upon the production of tetany, and, leaving out of consideration the gastric type, support the

view that the important factor is the sodium calcium ratio. (Tetany was not produced when the Na bicarbonate was lowered.)

The paper by Gross and Underhill naturally lends itself for discussion with the above. An investigation of the tetany following removal of the parathyroids in dogs has led them to the opinion that there is a marked change in the K/Ca ratio; convulsions are produced when this ratio exceeds 10. This makes it appear that there is something in the old view of the connection of parathyroid tetany with calcium. It will be remembered that Paton and Findlay have brought forward evidence in support of the view that in parathyroid tetany the toxic substance guanidine accumulates in the blood. The relation between these two abnormalities, which occur in animals with parathyroid tetany, does not yet seem to be clear.

de Quervain, F. Protection of the Parathyroids. [Beit. z. klin. Chir., XXXVIII, No. 1.]

Great care in operation should be exercised when one is working in regions where tetany is known to be common. Also when thyroid operations are undertaken. The author states that due to constantly bearing these two important factors in mind, as well as some minor ones, which he outlines in his paper, he has had no pronounced tetany development in over 2,000 operations. In three cases only were there slight functional disturbances suggesting possible parathyroid injury.

Grasmann, M. and K. Postoperative Tetany. [Arch. f. klin. Chir. CXXII, No. 3.]

This paper emphasizes the need for more care in avoiding injury to the parathyroids in such operations. The upper parathyroids can almost always be left unmolested, by leaving intact the posterior branch of the superior thyroid artery. Ligating all four arteries is a dangerous procedure, for postoperative tetany usually develops, and this syndrome is fatal in about one-fourth of all patients and leads to a chronic invalidism in almost as many more. If the still more subtle after effects bringing about full blown neuroses, psychoses, etc., which develop from meddlesome surgery were studied surgeons would be still more conservative.

Tisdall, F. F. The Influence of the Sodium Ion in the Production of Tetany. [J. Biol. Chem., LIV, No. 35.]

Sacki, F. Tetany After Unilateral Goiter Operation. [Med. Klin., XVIII, No. 36.]

This follow-up report of a tetany developing in a large robust man twelve years after removal of the right half of an enlarged thyroid. He has been under great emotional strain and worry of late, and tests showed gastric achylia. The severe paroxysms returned three times in all during the five weeks' course of treatment with calcium. This seemed to overcome the tendency to tetany.

Zahn, K. A. Calcium in Blood in Spasmophilia. [Mon. f. Kind., XXIV, No. 1.]

A biochemical study of the blood in three children with tetany, fifteen with a positive Chvostek, and eight with other diseases. One case of tetany only showed a lowered concentration of calcium ions by Trendelenburg and Goebel's method, although all three of the tetany had very low total calcium content. In latent spasmophilia some had low calcium, but others were average so far as the blood tasks could determine.

Luckhardt, A. B., and Goldberg, B. Preservation of Life of Completely Parathyroidectomized Dogs. [J. A. M. A., Vol. 81, Jan. 13.]

The therapeutic properties of calcium lactate in parathyroid tetany were investigated by administering this salt orally. The dogs used were put on a ration generally admitted to bring on, rapidly and severely, the fatal symptoms of tetany following the removal of the parathyroids. Each parathyroidectomized dog (the average weight of the dogs being 12 kg.) received daily one-half pound of meat and one-half pound of bread. Each dog received 10 gm. of calcium lactate dissolved or partly suspended in from 200 to 300 c.c. of cold tap water by stomach tube, early in the morning. Several hours later 20 gm. of calcium lactate were stirred up in ground meat and bread and offered to the animal. This food was devoured eagerly. Late in the afternoon the animal again received 10 gm. of calcium lactate by stomach tube as in the morning. The following results are recorded: Completely parathyroidectomized dogs can be kept alive without showing tetany on a diet very rich in meat by means of the oral administration of calcium lactate. The daily intake of calcium lactate early after parathyroidectomy must amount to approximately 1.5 gm. per kilogram of body weight. As time goes on, the daily amount of calcium lactate necessary to prevent the appearance of tetany can be reduced. After several months, the administration of calcium lactate can be stopped entirely without the appearance of tetany. The spontaneous tetany occurring thereafter at irregular intervals, presumably because of constipation or the ingestion of large quantities of unspoiled or small quantities of putrid meat or other spoiled food, can be rapidly controlled by the oral administration of calcium lactate and the giving of enemas. If, early after parathyroidectomy, the calcium lactate is withdrawn from the diet a single day, the animals will be found in most violent tetany within tweity-four hours or even earlier. Whereas calcium lactate given daily in doses of 1.5 gm. per kilogram prevents absolutely the occurrence of tetany, bone ash given daily in doses as high as 5 gm. per kilogram has no appreciable effect in preventing the onset of very severe tetany. As a result of muscular exercise and excitement, recently parathyroidectomized dogs on a low calcium intake may show sudden seizures identical with the convulsive seizures seen in grand mal attacks of idiopathic epilepsy. On the basis of these findings and the other data, the authors have sug-

gested the use of calcium lactate in idiopathic epilepsy in doses approaching those found necessary to prevent tetany in parathyroidectomized animals. On the basis of this, the authors believe that the rôle of calcium lactate in preserving the life of completely parathyroidectomized animals is quite complex.

II. SENSORI-MOTOR NEUROLOGY.

1. CRANIAL NERVES.

Kehrer, F. Pathology of the Pupils. Also a Contribution to the Theory of Myotonic Dystrophic Degeneration. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXXI, Nos. 3–5.]

Kehrer has reported many interesting clinical observations in a work of valuable detail and of an important critical nature. He reports *e.g.*, an interesting familial situation in which two brothers beyond the age of puberty manifest a myotonia almost entirely confined to the pupils in connection with spina bifida occulta and progressive muscular dystrophy with in part atypical location. A younger brother, thirteen years old, has so far only spina bifida occulta. Kehrer concludes from his observations that cases of complete fixation to light with incomplete narrowing of convergence without other disturbances in eye movement are more frequent than has been thought and that sometimes they are as important as the pure Argyll-Robertson phenomenon. He divides the so-called tonic reactions of the pupils into many individual types. He distinguishes between tonostatus, *i.e.*, tonic continuance of the movement and tonokinesis or tonic disappearance of the pupillary movement. He discusses also the various ways in which mydriatic fixation and the so-called catatonic fixation come about. He believes that every pupil theoretically can become relatively fixed to light in so far as in general it can be brought to the condition of maximal mydriasis through physiological stimuli. Mydriatic fixation would then be of special significance in distinguishing between epileptic and hysterical convulsions only when it was proved that in the individual in question it was not possible already to call forth a mydriatic convulsive condition by normal stimuli. He considers that the so-called paradoxical reactions are mostly to be explained on the ground that the normal reaction movements which precede the unexpected distension or contraction are overlooked for these very easily may escape notice because of their minuteness.

Shemeley, Wm. G., Jr. Plastic Labyrinthitis, Probably of Congenital Luetic Origin. [The Laryngoscope, October, 1923.]

Inflammation may be one of two types, either productive or destructive. Lues is the most frequent cause of the productive type. The patient was a young male of eighteen years, who had been deaf in the right ear as long as he can remember. For several years past he had had abscesses in

the right ear. At the time of examination he had an acute cold. The patient complains of noises in his head and at times suffers from dizziness, but the vertigo has never been severe enough to cause him to go to bed. The patient's mother stated that when one year old the young man had had a running ear. She did not remember which ear had been affected. The mother has had eight children, all are living and in good health. One brother had abscesses in the ears. The patient's father died suddenly, at fifty-six, from supposed acute dilatation of the heart. Examination of the patient brought out the following points: (1) The patient, although he had been treated previously in several clinics, was never subjected to an examination of the static labyrinth. His acoustic function had been tested only in a very superficial manner. (2) Analysis of the functional hearing tests shows the cochlear branch of the VIII nerve of the right side to be out of function, in that with the three meter speaking tube in the right ear and the noise producer in the left ear, the patient could not repeat the loudest spoken words. (3) The galvanic test shows the VIII nerve to still be reactive. (4) The turning tests show the static labyrinth of the right side almost completely out of function. (5) The caloric test proves that there is still some function remaining on the right side. (6) The fact that the patient's father died suddenly of an obscure heart condition, while comparatively a young man, together with the knowledge that an unrecognized, or improperly treated lues, is often the etiological factor in such heart cases, prompted the taking of a specimen of the patient's blood for serological studies. This was reported positive to all antigens. (7) The case, therefore, was diagnosed as a case of plastic labyrinthitis, probably of congenital luetic origin. [Author's abstract.]

Hamilton, W. F., and Laurens, Henry. The Sensibility of the Fatigued Eye to Differences in Wave Length in Relation to Color Blindness. [American Journal of Physiology, LXV, p. 569, August.]

Since color blindness is essentially a defect in hue discrimination and since there is evidence of a relation between the effects of selective fatigue and partial or complete color blindness, the effect of selective fatigue upon the ability to discriminate hue represents an interesting study. By appropriate apparatus the eye was fatigued by light of a certain spectral distribution immediately following which its ability to discriminate hue was determined. When the eye is fatigued by strong homogeneous red and green light the hue discrimination curves are similar to those typical of the protanope (red blind) and deuteranope (green blind) respectively. The hue discrimination curve of an eye fatigued by strong homogeneous blue (or violet) light is similar to that calculated from the sensation curves of the blue blind (tritanopic) eye. These are the results of selective fatigue, due to the obliteration of a particular sensa-

tion. In contrast to these results, when the eye is fatigued by homogeneous orange-red, yellow, blue-green, or white light, there is no selective effect on hue discrimination. There is no evidence of an antagonistic relationship between receptor pairs. When the eye of a protanope is fatigued with yellow light, which acts selectively in such a case, the number of discernible hues is reduced to three, rendering him practically a monochromat, but not an achromat. Fatiguing the protanopic eye with violet light has practically the same result. Appropriate tests of the influence of selective fatigue on the relation between "brilliance" and "chroma" vision do not support the view that the mechanisms subserving these two functions are independent. Fatigue reduces both of these aspects of a chromatic stimulus together. [Author's abstract.]

Ferree, C. E., and Rand, G. The Effect of Intensity of Stimulus on the Size and Shape of the Color Fields and Their Order of Ranking as to Breadth. [Am. Jl. of Ophthal., June, 1923.]

This paper represents one of a series of studies of the factors which cause the variable results in perimetry, and the precautions which should be taken for their control. In an earlier paper[1] the writers discuss the effect of changes in the intensity of the stimulus light on the size and shape of the color fields and their order of ranking as to breadth. An explanation was found for these effects in the irregular distribution of color sensitivity over the retina. Curves were given representing this irregularity of distribution in terms of the energy or amount of light required just to arouse the color response at near-lying points from the center to the periphery of the retina. In relation to explanation the situation may be summarized briefly as follows:

(1) The sensitivity to a given color falls off towards the periphery at different rates in the different meridians; therefore, a decrease in the intensity of the stimulus light causes the field to contract by different amounts in the different meridians, or to change its shape. (2) At some points (or rather over some regions) in the periphery of the retina the sensitivity to red is greater than to blue, and at others in the same meridian the reverse of this is true. Because of this fact a reversal of the order of ranking of the fields as to breadth occurs as the result of a change of the intensity of the stimulus light, a change which is frequently no greater than is produced by the variations in the daylight illumination of a well lighted room during the working hours of a single day.

In the present paper maps are given showing the effect of changes in the intensity of the stimulus light on the color fields. Results are included for two sets of conditions: high intensities, the fields having been

[1] Perimetry. Variable Factors Influencing the Breadth of the Color Fields. Amer. Jour. Ophthal., 1922, V, pp. 886-895.

taken with a rotary campimeter[2] designed especially for the use of spectrum lights over a wide range of intensities; and medium and low intensities, the fields having been taken with the clinic perimeter described in an earlier paper,[3] designed for the use of pigment stimuli under constant illumination and for the control of other variable factors needed in a precision perimeter, *e.g.*, the brightness of preëxposure and surrounding field, the correct location of the eye and its accurate and steady fixation for the various types of ocular defect, etc.

In the first of these series of experiments five intensities of light were used: The spectrum of a Nernst filament operated by 0.6 ampere of current, Intensity A; the colors of the spectrum made equal in energy to the blue at Intensity A, Intensity B; $^1/_{32}$ of Intensity A; $^1/_{32}$ of Intensity B; and the Hering pigment colors illuminated by 130 foot candles of light, horizontal component. The spectrum stimuli used were red ($670\mu\mu$), yellow ($581\mu\mu$), green ($522\mu\mu$), and blue ($481\mu\mu$). For intensities A and B it was found that the limits for red, yellow and blue coincide with the limits of white light vision. Green could not be made to have such wide limits. For intensity $^1/_{32}$ A the fields were from widest to narrowest in the order red, yellow, blue and green. That is, at intensities of this order of magnitude with the distribution of energies found in the prismatic spectrum of a Nernst filament the limits are concentric with both red and yellow outside of the blue. At intensity $^1/_{32}$ B, an equal energy spectrum, the limits for red, yellow and blue interlaced or criss-crossed. The Hering pigment stimuli under the intensity of stimulation used, 130 foot candles, also gave interlacing limits for red, yellow and blue, with fields roughly comparable in breadth with those of the spectrum colors at intensity $^1/_{32}$ B. A comparison of this result with the result for the second series of experiments shows that the Hering pigment stimuli gave interlacing limits for the same eye under 130, 51, 17 and 7 foot candles, although the limits for blue tended progressively to pass within the limits for red as the illumination was decreased. At 3 foot candles the limits were concentric for all but one point where they were coincident, with the red field wider than the blue. At 0.03 foot candle they had reversed for the greater part of the field, the limits for blue lying outside the limits for red.

In the second series of determinations five intensities of light reflected from pigment stimuli were used: The Hering standard pigments under 51, 17, 7, 3 and 0.03 foot candles of light. In order to show how these

[2] Description of a Rotary Campimeter. Amer. Jour. Psychol., 1912, XXIII, pp. 449-453; also A Spectroscopic Apparatus for the Investigation of the Color Sensitivity of the Retina, Central and Peripheral. Jour. Exper. Psychol., 1916, I, pp. 247-284.

[3] An Illuminated Perimeter with Campimeter Features. Amer. Jour. Opthal., 1922, V, p. 455.

illuminations compared with those falling on the perimeter arm at different times of the day in a room well lighted by daylight, measurements were made of the daylight at the level of the perimeter arm in a room 30 feet long with a row of six windows, southern exposure, the lower sills of which were somewhat higher than the perimeter arm. The measurements were made directly in front of one of these windows on a bright winter day. It was found that the highest intensity of illumination, 51 foot candles, was the same as that falling on the perimeter arm at the fixation point with the arm facing the window at 1 P. M.; the second highest, 17 foot candles, the same as that at 2:30 P. M.; the third highest, 7 foot candles, the same as at 3:45 P. M.; and the fourth highest, 3 foot candles, the same as at 4:15 P. M.

A decrease of illumination from 51 to 3 foot candles narrowed the limits for red by amounts ranging in the different meridians from 11 to 37 degrees; for blue, 13 to 37 degrees, and for green, 10 to 19 degrees. The decrease from 51 to 0.03 foot candles narrowed the limits for red 27 to 72 degrees; for blue, 29 to 61 degrees; and for green 22 to 45 degrees. The change in the shape of the fields also was quite radical from the higher to the lower illuminations.

It will be seen from the results of both of these sets of experiments how little dependence can be placed on breadth or shape of field and order of ranking as to breadth either in diagnosis or in checking up the advance or recession of a pathologic condition, unless greater precautions are taken for the control of the intensity of the stimulus than are possible under the conditions which ordinarily prevail in office and clinic work. Contractions, changes in shape, reversals, spiral fields, etc., may and doubtless do occur as the result of changes which take place in the daylight illumination of the room in which the fields were taken. Until some means are adopted in general use in the practice of field taking which provides for constant illumination of the stimulus at every point at which it may be placed in taking the field, not even the first step needed in the systematic application to diagnosis can be taken, namely, an agreement with reasonably satisfactory limits as to what are the normal fields. [Author's abstract.]

2. PERIPHERAL NERVES.

Coleman, C. C. Peripheral Nerve Injuries. [Kentucky Med. Jl., Feb., 1922.]

Peripheral nerve injuries are by no means rare in the ordinary accidents of industrial life but they are frequently overlooked until the patient has practically recovered from the more obvious lesions of other structures of the limb. The early diagnosis of a nerve lesion has a direct bearing upon satisfactory end results. The local wound conditions may not permit of immediate treatment of the injured nerve but even in such cases

certain valuable adjuncts to later operation may be promptly utilized. Massage, proper splinting and electrotherapy may be of great assistance in preventing fibrosis, contractures and other crippling effects of nerve injury, which if once established may cause a permanent disability even though the nerve itself should subsequently recover complete function. The accurate diagnosis of peripheral nerve injuries requires a thorough knowledge of the regional anatomy. With this knowledge it is possible to utilize the simpler tests for such injuries and place the examination upon a practical basis. Great care is necessary in the examination of motor paralysis. Faulty interpretation may arise from the unexpected appearance of voluntary movement in segments of the limb supplied by the nerve in question. Frequently the movement normally executed by the paralyzed muscles is effectively replaced by the action of supplementary muscles supplied by an uninjured nerve. Such substitutionary function is quite common in the upper extremities, and unless great care is exercised in determining which muscles are actually producing the movement, the examiner may conclude that either a nerve lesion is not present or if present is of slight consequence. In the interpretation of muscle function in the segments of the limb under observation, the examination should be so conducted as to eliminate the action of muscles whose nerve supply is not involved. The sensory examination is laborious and of less value than the examination of muscle action. It requires much patience and precision to determine the extent of sensory loss after the division of a peripheral nerve. Overlap from adjacent healthy nerves must be kept in mind to avoid error in the interpretation of sensory disturbance. The classical reaction of degeneration is rarely found, although some of its components are always present after severe injury and may help to complete the diagnosis. The ischemia sometimes produced by division of the main vessels of the limb adds confusion to the clinical picture of the nerve lesion and seriously interferes with regeneration of the nerve and the subsequent recovery of useful muscle function. It does not follow that division of the principal artery usually produces ischemic symptoms. On the contrary, marked ischemia was not often seen even when the axillary or brachial artery was divided. Severe nerve injury, however produced, should generally be explored at once for better disinfection of the wound or to apply immediate suture to the nerve, should it be divided. It is true that a considerable percentage of nerves which at first are totally paralyzed from gunshot wounds, recover function without operation, but in view of the impossibility of early determination by clinical examination, of the extent of the lesion and the importance of prompt suture of divided nerves, the slight operation of exploration is a logical procedure. It is rarely necessary to resort to the doubtful operation of transplantation to overcome nerve defects. Suitable positions of the segments of the limb and the shifting of the nerve to a more direct course will nearly always allow the nerve ends to be approximated without harmful tension. In a series of fifty cases studied more than a year after

operation, the musculospiral headed the list in recovery of motor function, while the regeneration of the ulnar was the most unsatisfactory of all. Suture of the internal popliteal gave better results than that of the external popliteal. Anesthesia persisted in some patients even after well-advanced motor recovery. This was true of the various nerves. Paresthesia in the distribution of the sutured nerves was almost a constant occurrence as a forerunner of regeneration, and sometimes amounted to actual pain. [Author's abstract.]

Cope, Z. Phrenic Shoulder Pain. [Brit. Journ. of Surg., Oct., 1922, X, No. 38.]

Referred pain is frequently felt on the top of the shoulder. It results, the author states, from stimulation of the sensory terminals of the phrenic nerve in or near the diaphragm. The third and fourth and sometimes the fifth cervical segments of the cord are the synaptic zones involved. Inflammation or irritation of the diaphragm or contiguous structures are the initial causative factors. An important localizing correspondence between the part of the diaphragm irritated and the position of the referred pain on the shoulder can also be mapped out. The presence of supraspinous, supraclavicular, or supraäcromial, or subclavicular pain is always of great value in diagnosis, as indicating an irritation of the diaphragm, its serous coverings or of closely lying organs.

Linell, E. A. Fibromyxoma of Peripheral Nerve. [Brit. Journ. of Surg., Oct., 1922, X, No. 38. J. A. M. A.]

The only symptom complained of by Linell's patient was that occasionally she had attacks of shooting pain from the site of the tumor down into the middle finger. She suffered no disability whatever, and had noticed no impairment either of muscular power or of sensation in the limb. The tumor was the size of a pigeon's egg, freely movable laterally, but not in the long axis of the limb. The essential connection of the tumor with the median nerve was not considered on account of the complete absence of motor or sensory symptoms. From the proximity of the tumor to the line of the nerve it seemed reasonable to ascribe the shooting pains in the median area to pressure, and a diagnosis was made of a soft fibroma arising from the deep fascia. Exposure of the tumor revealed a dark blue fusiform swelling which appeared to interrupt completely the continuity of the median nerve. The swelling was definitely cystic, and incision allowed the escape of a considerable quantity of dark, fluid blood. After careful consideration and in view of potential malignancy, the median nerve was resected half an inch above and half an inch below the tumor. This was removed, and primary end to end suture of the resected ends of the nerve was performed. Histologic examination showed the cyst to be a fibromyxoma, the typical structure of the majority of innocent false neuromas. Hence, Linell believes, in the absence of more definite evidence of sarcoma, such as infiltration of the nerve above and below the

lesion or adherence to surrounding structures, it would have been advisable in this case merely to puncture the cyst and remove as much as possible of its wall without interfering with the continuity of the nerve bundles, thus avoiding the risk of incomplete regeneration after resection and end to end suture.

Langley, J. N. The Nerve-Fiber Constitution of Peripheral Nerves and of Nerve-Roots. [J. Physiol., LVI, 382.]

In spinal nerves and in their posterior roots numerous small non-myelinated fibers exist, according to Ranson, and they far outnumber the myelinated fibers. Langley has investigated this and several other points in connection with the constitution of peripheral nerves. He finds that cutaneous nerves contain many nonmyelinated fibers, the nerves to skeletal muscles few. This result does not, he thinks, favor the view that these fibers have any considerable connection with striated muscle. Very few, probably no, non-myelinated fibers enter the spinal cord by the posterior roots. All anterior roots are distinguished from posterior roots by their containing a relatively large proportion of fibers, 13μ and more in diameter, and a relatively small number of fibers of about 7.5 to 11μ. The various rootlets of a nerve vary widely in their content of small fibers. In the posterior roots of nerves, which do not contain autonomic fibers in their anterior roots, there are a considerable number of fibers of 5μ, with a less number of 3μ. When the anterior roots contain autonomic fibers, the posterior roots corresponding have a greater number of 3μ, but not of 5μ fibers. The 3μ fibers in the posterior roots are probably afferents from unstriated muscle and glands. A large factor in determining the size of nerve-fibers is the nature of the tissue with which they may be connected. The material examined was obtained from cats. [F. M. Walshe.]

Heile. Operative Treatment of Sciatica. [Deut. Zeits. f. Chir., Sept., CLXXIV, No. 1–4. J. A. M. A.]

Heile has found in cases of rebellious sciatica that the pains are sometimes due to local pressure on the nerve which can be corrected. This pressure may be from an abnormal network of veins on the trunk of the sciatic nerve, as in a case illustrated, or from intraneural adhesion of fibers, or to some anomaly of the nerve itself, as in one case in which the pyriform muscle passed directly through it, the nerve fibers forking around the muscle. The epineurium may be sclerotic or there may be ascending neuritis. Severe anatomic changes may be found even with the symptoms of pure neuralgia. In some cases, relieving the nerve from external pressure as it passed through the sciatic foramen, cured the sciatica. In others, an intraneural injection mechanically separated adherent fibers or adhesion of the epineurium, and started the resorption of relics of inflammation. Merely slitting the nerve sheath may release the nerve from pressure. With actual pathologic conditions in the nerve

root, resection of posterior roots may be what is needed. In a case of pathologic conditions in the calf accompanied by symptoms of typical sciatica, mere resection of the gastrocnemius cured the pain. He warns that while acute and chronic affections of the epineurium are responsible for the sciatica in many cases, the epineurium must not be removed. It can be delicately lifted up with fine pincers and adhesions broken up between it and the single nerve cables or between the epineurium and the perineurium, but the anastomoses between nerve cables must not be molested. The intraneural injections were made with 30 to 50 c.c. of a 0.5 per cent solution of procain, followed by injection of 100 to 200 c.c. of saline, distending the nerve trunk to the utmost, thus prying the cables apart, and detaching the epineurium if it is adherent. Sciatica very rarely follows a gunshot wound of the sciatic nerve, and he ascribes this to the gap made in the nerve by the projectile. This allows secretions to drain away, instead of backing up and pressing on the nerve.

Engel, C. S. Relations Between Cancer and Nerve Substance. [Zeits. f. Krebs, Nov. 25, XIX, No. 4.]

Some interesting findings on the importance of nerves for regeneration of the organs of lower animals are here reported on. A connection may exist between the nervous system and the development of cancer, according to certain authors. The fact that the chemical irritants inducing cancer have an affinity for lipoids, and therefore for nerve substance is here dwelt upon.

Specht, O. Endocrine Factor in Electric Excitability. [Beit. z. klin. Chir., CXXVIII, No. 1.]

Specht gives fourteen pages of tabulated data of extensive experiments on guinea pigs to determine whether removal of one or several endocrine glands would modify spastic conditions. The experiments were numerous and diverse, but the findings were constantly negative. They do not sustain in any way Brüning's recent suggestion that removal of the suprarenals might favorably affect epilepsy.

Krabbe, K. H. Postneurotic Muscular Hypertrophy. [Rev. Neurol., Vol. 37, II, 802. Med. Sc.]

Krabbe describes a case of localized muscular hypertrophy in an otherwise healthy young fisherman of twenty-one. The muscles involved were those of the calf, and the condition was of eight years' standing, having developed after a sudden paralysis of both legs, associated with pain. Recovery had been gradual but never complete, and at the time of examination he complained of ready fatigue and of aching pain in the affected muscles. The circumference of each calf was 18 inches. The muscles were normal in consistence, both when at rest and in contraction. The power developed was less than normal. The electrical reactions showed no qualitative change, but were less facile than normal. There were no other signs of nervous lesion. The patient submitted to having a small

piece of the right calf muscle removed for examination. Microscopically, it was found that the fibers were very variable in diameter, being for the most part enlarged, but abnormally small fibers were also seen. There was no sign of inflammatory reaction, and no increase of connective tissue. There were numerous nuclei scattered throughout the substance of the fibers.

Krabbe has collected and summarized accounts of about twenty similar cases from the literature. In the majority, the onset followed an acute infection, typhoid being the disease most frequently responsible. Commonly, the onset is accompanied by weakness, pain, and often by sensory loss of a distribution corresponding to the topography of the affected musculature. Power is generally somewhat below normal, and unduly ready fatigue and pain are recorded as common symptoms. The electrical reactions are commonly diminished or lost without qualitative change. In such cases as were microscopically examined, the usual finding was hypertrophy of the muscle fibers without sign of inflammatory reaction or increase of connective tissue. Léri has classified muscular hypertrophy into (1) functional hypertrophy, (2) hypertrophy preceding the onset of atrophy, (3) hypertrophy in Thomsen's disease, and (4) hyperplastic muscular dystrophy. Krabbe considers all these cases to belong to the last-named group, which, however, includes cases of varying origin. Probably a localized neuritis is the exciting cause. In this connection a case reported by Lhermitte is of interest. The patient was a soldier wounded in the buttock in 1915. The sciatic nerve was injured and there was paralysis of the muscles below the knee. Accompanying this was a hypertrophy of the muscles of the calf and of the hamstrings. The affected muscles were firm and of the consistence of india-rubber. They did not respond to faradism. [F. M. R. Walshe.]

Hajek, K. Nervous Disturbances After Hydrophobia Vaccination. [Zeut. f. innere Med., May 3, 1924. J. A. M. A.]

Hajek describes a case of grave polyneuritis with slight central symptoms in a man who had received fifteen injections of diluted emulsion of cord after having been bitten by a rabid dog. Inoculations of the patient's saliva in dogs were negative. Therefore, it seems that the polyneuritis was due to the toxic effect of the vaccine in a predisposed man. He had previously had sciatica and neuritis of the brachial plexus.

Achard, C. Herpes Zoster. [Paris Méd., Feb. 23, 1924.]

Achard recalls that it is not yet established whether herpes zoster is a simple trophic disturbance of certain nerves or an infectious disease. Some claim it to be specific, others deny this. It has developed in the course of pneumonia, tuberculosis, syphilis and meningitis. Moreover, there is some evidence of contagiousness on record. There is a tendency of late to connect the herpes eruption with varicella, and, pathologically, to ascribe the disturbance to hemorrhagic lesions in the intraspinal ganglions.

Zeiner-Henriksen, K. Herpes Zoster with Motor Disturbances. [Norsk Mag. f. Laeg., Apr., 1923.]

This patient, a man of sixty-three years, had pains in left arm, shoulder and auricular region, at same time there was a paresis of the deltoid, and an atrophy of the infraspinatus, with arthritic changes and reduced mobility of the scapula. He assumed there was an infectious affection of the spinal ganglia of this region, spreading to the spinal motor cells corresponding to the muscles of the fifth cervical segment.

6. ENCEPHALITIS.

Gasbarrini. Encephalitis Lethargica. [Archiv. di Patolog. e Clin. Med., June, 1922, p. 353.]

The classical features of the disease are first given. A detailed analysis of the various symptoms follows and he then points out the chief clinical data which serve to differentiate this disease from other affections. He thinks there has been too much division of the disease into a number of different types. On the whole, he believes encephalitis lethargica has no direct relation with influenza. Dubini's electric chorea corresponds to the myoclonic form of encephalitis. There is some ground for believing that epidemic hiccup is a form of encephalitis. According to the predominance of certain symptoms the disease may be of a somnolent type, a myoclonic, a polyneuritic, or more rarely a hyperkinetic variety. The course of the disease may be acute, subacute, or chronic, lasting for months or years. Oscillation and relapses are not uncommon. Amongst the sequelæ the author draws special attention to the Parkinsonian symptoms, the pseudoparalysis agitans, and to the inversion of the rhythm of sleep and wakefulness, so that night is turned into day. Mortality varies very much—5 to 55 per cent. So far no therapeutic means has been found to cure the disease.

Mills, A. E. Encephalitis. [Assoc. B. M. J., New South Wales, June 1922.]

Mills related the histories of three cases of interest from a diagnostic point of view, all presenting features somewhat in common. The first patient was a woman, aged twenty-seven years, hale and hearty, somewhat stout, but in good health. She went to bed one night feeling perfectly well and awakened her sister who was sleeping in the same room at midnight by sitting up in bed and talking nonsense; she talked about tying a lot of parcels with string. She lay down and again went to sleep. In the morning she got up and was able to do her hair. About one hour later her sister thought that she was looking strange. She suddenly became unconscious and was seized with convulsions. She remained in this condition till her death fifteen hours later. Professor

Mills saw her a few hours before her death. At this time she had paresis of the right arm and the right leg, both of which were rigid. She had conjugate deviation of the eyes to the right. Her head was turned to the right. The condition looked like one of uremia, though the state of the heart was not in keeping with this supposition and the condition of the blood vessels did not suggest the presence of arteriosclerosis. She had passed her urine into the bed. A specimen of urine obtained just before her death proved to be normal on examination.

The second case was that of a young woman, aged twenty-four years, who lived in the same suburb as the patient previously mentioned. Mills was called to see her by the same practitioner, but before he could get to the house the patient died. The history was very similar to the one first reported. She had been apparently in perfect health before the onset of the disease; she had suddenly been seized with convulsions, had become unconscious and had died fourteen hours later. The only difference in the second case was that the convulsive seizures had not been so violent nor so frequent.

The third was that of a woman who was apparently in good health. She was a squatter's wife. Her husband asked her to go out with him on the run, but she refused on the plea of having too much to do. This was at two o'clock in the afternoon. At three o'clock she was playing the piano. Between that time and five o'clock she became ill. Her husband came home at five o'clock and found her unconscious and convulsed. She remained in this condition for thirty-six hours and then returned to consciousness. Her right eye was then noticed to be closed. In addition to this she had paralysis of the third and fourth nerves. The sixth was intact. Professor Mills stated that, at the present time, the patient was getting back to normal health, though she was still in a state of malnutrition. No improvement of the paralysis had occurred.

In discussing the diagnosis of these cases Mills pointed out that all of them were characterized by the sudden onset of coma and convulsions, which continued for many hours. In the first two cases the convulsive movements ended in death. In the third case, when the convulsions ended, the right eye showed complete paralysis of the third and fourth nerves. Professor Mills further said that it was not uncommon for a patient to lose power of the third and fourth nerves suddenly or in the course of a few hours. Such a condition was of vascular origin and due to a thrombosis following on a syphilitic endarteritis or atheroma of the vessels supplying the third and fourth cranial nerve nuclei; but such cases were not associated with coma or convulsions. In the third case, however, the patient's serum had not reacted to the Wassermann test, nor had there been any symptoms to suggest syphilis as the causative factor in the other two cases. The persistent convulsions pointed to a continuous irritative affection of the cells of the

motor area, the coma being the result of a process abolishing the function of higher parts of the brain. In the absence of poisons by uremia or alcohol in the form of absinthe and with no evidence of trauma, it would appear that the symptoms and signs present in these three cases could only arise from the presence of inflammatory or edematous products—the result of a widespread infection of the brain. They were the examples of a severe encephalitis. Wernicke had described two types of encephalitis, a superior type, affecting the cortex, accompanied by coma and convulsions, and an inferior type, affecting the pons and the medulla, leading to paralysis of the respiratory center and death. But there could be no question that many varieties existed. In all these cases it was probable that the coma and convulsions had been due to cortical affection. In the first two cases death had been brought about by extension of the disease to the medulla. In the third case the disease process had also involved the mid-brain and destroyed the third and fourth cranial nerve nuclei.

v. Sarbo, A. Encephalitis Epidemica as Seen in the Epidemic of 1920. [D. Zschr. f. Nervhlk., Vol. LXXIV, Nos. 5, 6.]

The author presents a series of symptoms which remained in fifteen out of twenty-five cases. Of the rest four had died, six were cured. Of this fifteen ten showed the amyostatic symptom complex. This appeared in the narrower sense as symptoms of involvement of the lenticular nucleus or there were also myasthenic phenomena. Retropulsion, staggering backward, *i.e.*, a hypokinesis, and bending backward of the upper portion of the body, *i.e.*, hypostasis, were seen as cerebellar symptoms. Among the vasomotor, trophic and inner secretory disturbances were seen, pasty condition of the skin of the face, dryness of the entire skin, salivation, all of which are perhaps to be connected with the hypothalamus. Amennorrhea and excessive loss of flesh were also observed. Disturbances of sleep, familiar symptoms, were also present. [J.]

Teissier et al. Inoculation of Herpes in Encephalitis. [Bull. Méd., March 10, 1923.]

The seven patients inoculated with herpes responded with the same skin lesions as the healthy and patients with other diseases.

Salmon, A. Postencephalic Parkinsonian Bradykinesias. [Riforma Medica, 1923, No. 6.]

One of the most singular of the postencephalitic Parkinsonian syndromes is that in which patients who are almost absolutely rigid and mute, at certain periods and under certain circumstances seem to lose this rigidity suddenly and are able to run, dance, ride bicycle, sing, etc., and then in a few moments relapse into the primitive state of immobility and of mutism. This phenomenon, known as paradoxical kinesia, described by Tilney and others, and which makes a striking

contrast with the grave symptoms presented by these patients, according to Salmon, loses its obscurity when it is regarded not solely in the light of a motor phenomenon, but is conditioned upon an affective deficit which manifests itself to a considerable degree in depression and dysphoria which acts upon the psychical in the same way as upon the motor activity.

The phenomena of paradoxical kinesias consists precisely in the momentary recall of the psychoaffective energy of these patients. This hypothesis finds its best confirmation in the fact that the motor phenomena just described surge upward generally in response to affective stimuli in the interest taken by the patients in their efforts in bringing about certain movements. They can speak or walk with rapidity if they are angry or in good humor, especially when in view of some recompense. They can ride the bicycle and dance.

The affective defect in these patients can be attributed with some difficulty to striate or corpus niger—lenticular lesions, which are found frequently in the Parkinsonian cases which lesions are considered by the majority of authors as the causes for the muscular rigidity. The striatum alterations are exclusively of motor import (Lhermitte). The basal ganglia represent coördinating synapses for emotional expression, but are not centers for emotivity, that is centers through which are regulated that dynamism which one may call "affective energy." Salmon assumes that in order to explain the affective deficit of the Parkinsonian encephalitic patients one must invoke a cortical participation. Such cortical involvements are well known in the literature. He cites v. Economo, Marie et Tretiakoff, Buzzan, Bassoe and Hassin, Gamna, Luzzatto e Rietti and others. Anglade particularly states he has found frontal lesions in this syndrome. Such involvement Salmon believes explains the affective torpor as well as the mental syndromy (mutism, melancholia, mental viscosity, etc. The paradoxical kinesia phenomena justify the idea that the striatum and cortical alterations determining the motor and psychical rigidity of the patients, at least in the initial phase of their affection, does not consist in very profound alterations or degenerations of nervous elements, but in a very light cellular alteration, probably in a metabolic disturbance of the nerve cells similar to sleep, that which determines the psychomotor torpor of these patients. [Author's abstract.]

Vincent, C., and Bernard, E. Encephalitic Pulmonary Edema. [Bull. d. l. Soc. Méd. des Hôp., July 28, XLVI, No. 26. J. A. M. A.]

Vincent and Bernard describe a typical case, and emphasize that the clinical picture is the same as with traumatic pulmonary edema, and the treatment is with epinephrin and pituitary extract. The epinephrin is given under the control of the pupil reaction to instillation of five drops of a 1:1,000 solution in one eye. In the normal, this dilates the pupil in

from ten to thirty minutes, and there may be very slight exophthalmos. In acute encephalitis, the pupil shows no reaction, and if there is any change in the eyeball it is in the nature of enophthalmos. This response calls for epinephrin at once, with or without pituitary. In case of pulmonary edema, the physician and the nurse should keep close watch over the patient, recording the pulse, blood pressure and respiration every four hours and applying at the same time the epinephrin pupil test, or repeating it oftener in case of doubt, and giving a subcutaneous injection of the epinephrin four times a day if needed. In five cases this method of treatment carried the patients safely through extremely grave pulmonary edema and prevented its return. They warn that a violent shock may follow injection of epinephrin when the pupil test is neglected or the pupil dilates under it. The dilation of the pupil testifies that the epinephrin content of the blood is adequate, and no more is needed for the moment.

Kerlin, W. S. Lethargic Encephalitis. [New Orl. Med. & Surg. Jl., April, 1923.]

Four cases are here reported. They all show late manifestations or recrudescent symptoms. In one inability to control the movements, restlessness and jerking of the hands was present. Constant yawning and drowsiness characterized a second syndromy. Nervousness and a tremor involving principally the muscles of the right leg and nervousness as well as weakness of the back muscles were present in two others.

Netter, Arnold. Herpetiform Eruptions in Encephalitis Lethargica. [Bull. et Mém. Soc. Méd. des Hôp. de Paris, Vol. 46, July 6.]

The author states that he has seen herpetiform eruptions in the course of encephalitis lethargica in two cases and has found records of three others; he considers that they occur in at least 1 per cent of all cases. Guizetti (Parma) and Bériel (Lyons, have described the pathological changes found in the posterior spinal root ganglia and in their cranial homologues in the case of two women who died after twenty and twenty-six days' illness, which commenced with intense pain accompanied by myoclonic spasms. The ganglia and nerve roots showed an inflammatory exudation, consisting chiefly of lymphocytes with a few plasma cells. The nerve cells were largely retracted and the nuclei were opaque and atrophic. These changes were found in all the nuclei of the sensory nerves of the areas in which intense pain had occurred during life. Netter's first case was that of a healthy man of thirty-four in whom intercostal herpes preceded (by nine days) an attack of myoclonic encephalitis, from which he recovered. The second case was a child in whom intercostal herpes and encephalitis occurred simultaneously; she recovered. In the third case, reported by Medea (Milan), the encephalitis was accompanied by supraorbital herpes, followed by paresthesia of the affected area. In the fourth case (Souques) bilateral herpes zoster

followed the encephalitis eight months after its onset; myoclonic spasms of the left side persisted. In the fifth case (Simone) the patient was aged eight and a half years. Encephalitis commenced on March 25. On April 6 bilateral gluteal herpes appeared. Patient was admitted to hospital on May 27 quite unconscious. The child died on October 10 of streptococcal meningitis. Histological examination of the brain and salivary glands showed changes characteristic of encephalitis. On April 21 (that is, fifteen days after this patient developed herpes) another child in the same ward (admitted February 2) developed varicella, and on May 5 another little girl (admitted March 13) also developed confluent varicella.

Kennedy, Foster. Peripheral and Radicular Types of Epidemic Encephalitis. [Am. Journ. of the Med. Sciences, Vol. 163, January.]

The peripheral and radicular types of epidemic encephalitis are here discussed. The author lays stress on the fact that the various clinical "types" described in this disease do not represent separate diseases, but are merely varieties of the one infective disease in which the gravamen of infection has fallen with special incidence upon a particular portion of the nervous system. It is, however, maintained that variety of clinical form might be produced by variety of virus or by a constant infective agent appearing in different evolutionary phases. Whatever may be the bacteriological explanation, it is certain that the peripheral nerves and spinal roots may be affected in acute encephalitis to a considerable degree. In a certain proportion of recorded examples the distribution and character of the painful symptoms have compelled the observer to conclude that the lesion has been essentially an involvement of the nerve roots and peripheral nerves. Sensory changes similar to those commonly observed in tabes dorsalis have been noted; in a smaller number of patients localized atrophies of muscles have occurred such as would result from involvement of contiguous anterior roots. Palsies of single cranial nerves have not been uncommon, the third and seventh nerves having been particularly affected. In most instances in which the seventh nerve has been involved, there has been no demonstrable lesion of the fifth, eighth or sixth nerves, thus excluding the possibility of a lesion in the pontocerebellar angle or in the nucleus of the facial nerve in the pons. Occasionally single peripheral nerve trunks have been picked out in similar fashion. The prognosis in peripheral and radicular varieties of this infection is usually good. In patients dying from widespread involvement of the central nervous system, perivascular round-celled infiltration and occasional hemorrhages have been observed in the posterior root ganglia. The author points out that the cases described in this report are essentially similar to the morbid condition previously recorded as "acute infective neuronitis" and that a minor epidemic presenting an analogous clinical picture occurred among soldiers in the field during the recent war.

III. SYMBOLIC NEUROLOGY.

3. PSYCHOSES.

Rosental, S. Attacks in Dementia Precox. [Zschr. f. d. ges. Neurol., Vol. LIX.]

Rosental reports an investigation to determine whether the epileptiform, so-called catatonic attacks which appear in approximately 10 per cent of the cases of dementia precox are of psychogenic nature or belong to brain pathology. He discusses the significance of the following symptoms studied in 7 cases: loss of consciousness, fixation of pupils, the relation of the corneal and skin reflexes, of the Babinski, Oppenheim and patellar reflexes, disturbances of sensibility, etc. He considers that Babinski's phenomenon, which however is often only fleeting, is the only sign of brain pathology.

Kollarits, Jenö. Psychic Guidance of Chronic and Incurable Patients. [Schweiz. med. Wschr., Vol. 53, No. 3.]

The author draws certain conclusions of a medical nature from his study of the bearing of suffering. They are important for the physician because he should guide psychically chronic patients and incurables. This is neglected. The physician must direct his attention to the sphere of the patients' striving, create opportunity for an activity be it ever so slight. To find this is the physician's task. It is a lack in hospitals, sanatoria, homes and insane asylums that the patients who can do something are not occupied or not sufficiently so. It is just as important in diseases with recovery not so much on account of distraction, but much rather to keep the organism in force. Illusions also belong to the organic strivings. In this respect the physician, it is true, often stands before unanswerable questions where he cannot make known the worst; on the other hand he can also do injury through hopes that cannot be realized, especially if he holds these out before the patients who have already found relief in suffering. The patient is not grateful for words of comfort which often turn out to be only vain, arguments which are at odds with the suffering call forth opposition. Kindly entrance into the suffering, sympathy, the patient accepts gratefully and quietly. Complaints are to be heard patiently by those in the environment except from those neurotics who suffer from a complaining mania [Klagesucht (Jendrassik)] and grow no better so long as they may complain. Complaints are to be forbidden them.

Alford, Leland B. A Defective Mental Make-up and the Pernicious Forms of Torticollis, Tinnitus, Neuralgia and Pruritus. [American Journal of Psychiatry, Vol. II, No. 1, July.]

Alford produces evidence to support the theory that the conditions indicated in the title are similar in nature, age of onset, response to treatment, and are predominantly monosymptomatic and, as Alford believes, of degenerative central nervous system origin. [Menninger.]

Kretschmer, E. Psychopathological Research and Its Relation to Present Day Clinical Psychiatry. [Zschr. f. d. ges. Neurol., Vol. LVII.]

The author discusses the method of psychiatric thinking. He complains that the conception of the cause of disease is not clearly stated. Actual causes of disease and "mere" precipitating cause are set over against one another, as are also genuinely causal and merely rationalized connections, "actual" causes of diseases and "only" symptom formation. Everything psychological is in reality biological, he reminds us, and biology is the only object of psychiatry. For example, the change of the disposition in the manic is a simple biological matter, his complicated delusional system a more complex one. One is just as biological as the other. There is no true foundation for the distinction which sets off the disease unity from the symptomatic picture. General paresis may be classified exogenously from the point of view of the infectious diseases as a disease entity, but from the standpoint of the constitutional factor as a syndrome which cannot yet be defined. Dementia precox or manic-depressive psychosis may be classified as a disease entity, syndrome or otherwise just as the internist may consider cerebral apoplexy as a disease in itself, as a manifestation of arteriosclerosis or a complication occurring in nephritis. There is therefore no antagonism between the psychic and the somatic point of view. The future, the author believes, will bring to psychiatry a unified biological, constructively synthetic conception of psychophysical phenomena.

Van Ophuijsen. On the Origin of the Feeling of Being Followed. [Int. Zeit. f. Psa., VI, No. 1.]

The origin of the delusional belief of persecution, the manner of persecution and the persecutor have already been studied. The author adds a few remarks in this short article setting forth some supplementary observations. According to him the feeling of persecution is one which is never absent in the psychoneuroses. It must here be distinguished from the psychosis of persecution in the strict sense of the word. The various forms which this feeling may take are: neurotic ideas of reference, fear of being attacked from behind, a dislike of being followed in the street, or upstairs, dreams of persecution, etc. All these phenomena Ophuijsen derives from the anal complex. In support of this view he cites dreams and experiences. He believes that others may have observed the same facts and suggests psychoanalysts carefully examine their patients suffering from persecutory delusions for the purpose of determining whether the view that anal persecution is the original form of the persecutory feeling is justified by the facts. In a note the writer adds that Dr. Stärcke has confirmed his interpretation of persecutory delusions and gave expression to the same opinion at a meeting of Dutch Analysts. [Willard.]

Wells, F. L., and Kelley, C. M. The Simple Reaction in Psychosis. [American Journal of Psychiatry, Vol. II, No. 1, July.]

This is a report of further experiments corroborating previous findings to the effect that the reaction time is generally lengthened in psychoses. [Menninger.]

Freud, S. Neurotic Mechanism in Jealousy, Paranoia, Homosexuality. [Int. Jl. Psa., IV, No. 1–2.]

Jealousy is one of those affective states, like grief, that may be described as normal. If anyone appears to be without it, the inference is justified that it has undergone severe repression and consequently plays all the greater part in his unconscious mental life. The instances of abnormally intense jealousy met with in analytic work reveal themselves as constructed of three layers. These are here described as (1) competetive or normal jealousy, (2) projected, and (3) delusional jealousy.

Freud says regarding normal or competettve jealousy it is essentially compounded of grief, the pain caused by the thought of losing the loved object, and the narcissistic wound, further of feelings of enmity against the successful rival and of a variable amount of self-criticism which tries to hold the person himself accountable for his loss. Although within the range of "normal" this jealousy is not rational for it has its deeply-rooted unconscious components and shows early inadequacies in the evolution of the Œdipus situation. Freud points out that this jealousy not infrequently is experienced bisexually; here early homoerotic components are concerned.

The second or projected type of jealousy is derived in both men and women either from their actual unfaithfulness or from repressed impulses towards such. Marriage fidelity is maintained, for the most, in the face of continual temptation. Anyone who denies this in himself seeks relief by projection. He also absolves his conscience by making his partner the guilty one in consciousness. She, or he, is not much better than the jealous person. The social conventions permit a certain amount of flirtatiousness to thus handle this tendency and the desire (floating libido) which would go out to the new object is gratified by a kind of turning back to the object already possessed. The jealous person, however, is not tolerant of this conventional tolerance. He wants to make an issue of the "flirtation" and refuses to see it, in its usual aspects, as a safeguard against actual infidelity. This type of projected jealousy is amenable to treatment, but shades over imperceptably into the true delusional type of jealousy. Here also are unfaithful impulses under strong repression, but the object of the libidinous tendencies is homosexual. Paranoid forms show this type of delusional jealousy. The formula says "indeed *I* do not love him," *i.e.*, have homoerotic wishes, "she loves him." Hence the patient becomes jealous of her and this jealousy, writes Freud, shows itself in all of the layers described.

In his second paragraph on Paranoia, Freud writes that in an intensive study of two paranoiacs he has learned some new things. These may alter earlier dogmatic positions taken regarding the inapplicability of analytic investigation to this general type. His first case was a youngish man with a fuller developed paranoia of jealousy, the object of which was his impeccably faithful wife. When seen a long period of delusional possession lay behind him, but at this time he was subject to clearly defined attacks which lasted for several days and, curiously enough, regularly appeared on the day following intercourse which was stated to be satisfying to both. The inference is justified that after every satiation of the heterosexual libido, the homosexual component, likewise stimulated, forced for itself an outlet in the attack of jealousy. The material upon which the jealousy fed itself consisted of the most minor forms of contact—it even extended to interpretations of her "unconscious" activities concerning the interpretations of which he was "always in the right." It is well known that the usual persecutory paranoiacs show this mechanism in a striking manner. Their "delusions of reference" take up the smallest details of what other people are doing with reference to their feelings about them. The jealous husband patient perceives his wife's unfaithfulness instead of his own; by becoming conscious of hers and magnifying it enormously he succeeds in keeping unconscious his own. The enmity which the persecuted paranoid sees in others is the reflection of his own hostile impulses against them. Here for the paranoiac as for the jealous patient the defense in both instances is against the homosexual component. Freud found this patient's dream material to contain some interesting features, especially those occurring within the period influenced by the delusional material. In these the delusional material had vanished. Homosexual tendencies slightly disguised were characteristic. This trend existed in rather primitive form as the patient had made no friendships and developed no social interests. His delusion might reasonably be regarded as his first bit of previously neglected homosexual adjustment. An inferior father and an early homosexual trauma had forced this component into repression and presented its sublimation. He was mother's favorite and often had so-called normal jealousy situations with reference to her. Obsessive ideas relative to his wife's virginity were other indications of the mother fixation. At first he was free from jealousy. He then had an affair of some duration which was terminated under suspicion when the projected jealousy ideas came through thus assuaging his own self-reproach. Homosexual impulses, directed towards the wife's father, then completed the development of the jealousy paranoia.

A second case whose diagnosis only appeared on analysis showed a striking father ambivalence. Rebellious on the one hand and an abject son, with such an attachment to his father's memory that he could not get any joy from women. With men he was suspicious but a keen intellect rationalized this attitude. From this patient Freud states he learned that classical ideas of persecution may be present without finding belief or

acceptance. They flashed up but were scoffed at or deemed unimportant. This may occur, he writes, in many cases of paranoia. The apparently new delusional outcropping may have existed in this form before the outbreak of the disease as ordinarily interpreted. The quantum of cathexis now becomes important. [The *condensor capacity* of the symbol has been the reviewer's phrase to express this same situation. See The Symbol as an Energy Condensor, Jl. N. & M. D., Dec., 1919.] Thus overinvestment of the interpretation of the unconscious behavior of others, in the first case, also illustrates the importance of this quantitative factor, which has been known for some time in the hysterical reaction for instance where the sick phantasies can be tolerated alongside of the normal life and only when the change in libido direction overloads them—hypercathexis—does the conflict arise which causes the symptom formation.

These two patients showed interesting contrasts in the dream material. The first showed no delusion formations, the second contained a number of persecutory features, forerunners of the substitutive developments of the delusional ideas. The pursuer, a bull or other wild animal, was readily recognizable as the father. One dream Freud characterizes as a characteristic paranoiac transference dream. In it Freud was shaving in front of the patient. From the scent of the soap he realized that Freud was using the same soap as his father had used. This procedure was interpreted, by the patient, as an effort to induce in him a father transference onto Freud.

The author now takes up an interesting point with reference to dream formation. Such is distinguished from waking thought in that for their content they can draw from material which cannot emerge into waking thought. They are, further, a form of thinking, a transformation of preconscious thought material by the dream work and its conditions. The conscious terminology of the neuroses is not applicable to repressed material. When the first patient was delusional, his dreams were "normal." Those of the other were paranoiac in content while he treated his delusional ideas with contempt.

Even though a somatic factor may be granted for a homosexual the psychical structure is none the less capable of analysis. The usual process is that the young man, some years after puberty, turns from a previously marked mother fixation, identifies himself with his and looks about for love objects in which he can rediscover himself, and whom he wishes to love as his mother loved him. One of the conditions of this early stage is that the object must be of the same age as he himself was when the change took place. The various steps in the formation are of interest. The first mother fixation depreciates other women. This gives rise to the identification and permits being true to his first love. This then permits the preference towards the narcissistic self and the greater ease in obtaining erotic satisfactions than from the opposite sex. Behind this there lies a highly dynamic factor, *i.e.*, "the high value set upon the male organ and the inability to tolerate its absence in a love object." Depreci-

ation, aversion, even horror of the woman are usually derived from the early discovery that women lack a penis. Correlated with this excessive regard or fear for the father may be another determiner for the homosexuality. The two last are bound together in the castration complex. Thus in the psychical etiology of homosexuality there are found mother attachment, narcissism and the castration fear (not specific), which when added to by some homosexual seduction bring about the premature fixation and the passive rôle already possibly aided by the inferior gonadal system. The incompleteness of this formula Freud says has always been felt. A new determiner is presented—whether it relates to the extreme, manifest and exclusive types of homosexuality is not yet apparent. Intense brother (and sister) chiefly older brother, rivalries are frequently observed in analytic study. The mother complex factor is evident. Later these rivals become the first homosexual objects. The contrast with the paranoiac mechanism in which the early loved object becomes the later hated persecutor here shows the early rival as the later love object. It also represents an exaggeration of the process, which Freud has developed in his "Massenpsychologie," as leading to the birth of the social instinct in the individual. Jealous and hostile feelings cannot achieve gratification, personal affectionate and social indentification—feelings arise as reaction-formations against the repressed aggressive impulses. This new mechanism in the homosexual object-choice, its origin in rivalry which has been overcome and in aggressive impulses which have become repressed, is often combined with the typical conditions known to us. [J.]

Hoch, August, and MacCurdy, John T. Prognosis of Involution Melancholia. [American Journal of Psychiatry, Vol. I, No. 3.]

The author's conclusions from a very careful study of this subject which interested Dr. Hoch for many years are as follows: The results in a series of sixty-seven patients in whom the final outcome was determined in all but one case, cause us to conclude that patients with involution melancholia recover unless they show as dominant symptoms: marked insufficiency of affect, peevish or autoerotic behavior, or ridiculous hypochondriac delusions which usually are concerned with the alimentary tract. These prognostically bad symptoms may be present for a short phase of the psychosis in women at the menopause without their prejudicing the outlook for recovery. All patients who eventually recover show some improvement within four years after the onset. The others run a chronic course or die unimproved. [Menninger.]

Barrett, A. M. Psychopathic Personality. [The Medical Clinics of North America, VI, 1165.]

This is a class of individuals who are not insane, in a legal sense, but yet are not normal. Individuals of this type find it difficult to adjust themselves to family life and social relationships. This leads to conflicts with the law or they become social failures that must be given special con-

sideration. They have been variously designated as psychopathic personalities or as those who are of constitutional psychopathic inferiority.

There are various types of constitutional psychopathic inferiority. In some individuals the abnormal qualities show as emotional instability with a tendency to ourbursts of excitement and disordered behavior under even trivial annoyances. In others there is weakness of the will with inability to follow any sustained plan. Others suffer from a marked prominence of the imagination which leads to a pathological type of lying and acts of deceit.

The first patient was a soldier, twenty-three years old, who was sent to the hospital for observation because of several acts of misconduct committed while he was in the military service. As a child he had had an ungovernable temper. There was constant friction between him and his family. There were numerous instances of truancy, which usually followed some irritation in school or family. At the age of twelve he ran away from home, returning after three months. His irritability never left him. Brief outbursts of passion were frequent, and in these he would act blindly, usually throwing whatever he could get hold of at his annoyers. He was courtmartialed six times within a period of two years. He had no feeling of remorse over his actions. He thought that he was being persecuted, that others had done the same thing and gotten away with it. His physical and neurologic examinations were negative.

Morgenstern, S. Belladonna Delirium. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXXII.]

Morgenstern reports two cases observed at different times which revealed similar symptoms. Both patients were eccentric characters and the author believes that the hereditary disposition and the environmental factors of the moment must be taken into account. The symptoms observed were sudden onset with strong excitement, violent course of the disturbance, profound confusion in which temporarily coherent answers could be obtained, anxious perplexity, amnesia, absence of hallucinations of hearing. There was a catatonic-like position of the head in both patients.

McCarthy, Daniel J. Dementia Praecox and the Adolescent Psychoses from the Organic Visceral Viewpoint as Regards Prognoses and Therapy. [American Journal of Psychiatry, Vol. I, No. 3.]

McCarthy divides the psychoses into degenerative and nondegenerative groups, the latter of which includes the curable cases which he thinks are much more numerous than is generally supposed. He finds some of them due to introspective excesses, some to psychosexual disorders, some to purely environmental factors and some to visceral disease. In the latter he is particularly interested and presents certain criteria of physical debility found in these cases, particularly arterial hypotension, under-

weight, viceroptosis, flat chest, flat feet, cartarrh, chlorosis and exaggerated reflexes. McCarthy's therapy is to clear up the environmental factors as far as possible and then to combine psychotherapy (which "is an art, not a science") and contribute toward the best possible physical condition by putting the patient at complete rest *a la* Weir Mitchell. He combines this with physical therapy, massage, gymnastics, postural and occupational therapy. A detailed discussion of the various features of technique is included. [Menninger.]

Hamburger, W. W. Acute Cardiac Psychoses. [Medical Clinics of North America, Sept., Vol. 6, 465.]

In certain cases of advanced and recurring heart failure, mental symptoms sometimes develop which are so severe as to justify the term acute cardiac psychosis. Five such cases are here reported. All of the patients suffered from acute confusional states coinciding with the period of severe decompensation. They were all patients over forty-five years of age and showed, for the most part, evidence of advanced arterial change. It is likely that, in addition to the generalized arteriosclerosis which they presented, there was an associated cerebral arteriosclerosis with accompanying nutritional brain changes. Blood pressure readings with one exception were over 170 mm. In addition to these findings, each patient gave an additional etiologic factor, namely, digitalis, belladonna, quinidin, alcohol and lead respectively. The dosage of the drugs used in individuals with normal circulation and normal blood vessels would not in all likelihood have been followed by untoward symptoms. One concludes, therefore, that the development of these confusional states may be due to the effects of these drugs on a circulation severely embarrassed, and on tissues with profound and widespread changes. From the standpoint of treatment there is little to be said except possibly from a prophylactic standpoint. In patients over forty-five years of age, with severely embarrassed circulation and with arterial changes, localized particularly in the cerebral vessels, medication should be given cautiously and in amounts somewhat lower than the average doses.

Henry, G. W. Some Roentgenologic Observations of Gastro-Intestinal Conditions Associated with Mental Disorders. [American Journal of Psychiatry, Vol. III, No. 4, April.]

In addition to the variability due to habitus, the author observes that visceral position, tonus, and motility are affected by different types of psychoses. Observations were made on over one hundred unselected cases in which no definite organic disorder was found. In the manic phase of affective psychoses there is a definite tendency toward normal or even higher position, normal or hypertonic tonus, and normal or even more rapid motility. The depressive phase shows a definite tendency toward just the opposite conditions. Those depressed patients who are more poorly nourished show the characteristic findings in depression to be more

accentuated. In contrast to this, those excited patients who are markedly underweight nevertheless show findings typical of the manic phase. Such findings indicate that weight is a relatively unimportant factor. Results tend to show that the degree of abdominal tension is also an unimportant factor. Markedly depressed patients show greater intestinal sluggishness than those only mildly depressed. Involutional melancholias show approximately the same conditions as other depressions. Catatonic forms of dementia precox tend to show normal or higher position, with hypertonicity, but hypomotility. Paranoid forms show a tendency toward higher position and a greater amount of tonus than the normal, but a marked hypomotility. Paranoid states show a tendency toward higher position and greater tonus than paranoid dementia precox, with only slight hypomotility. In all psychoses with paranoid trends there is a tendency toward hypomotility and hypotonicity of sigmoid and rectum. Psychoneurotics seem prone to hypertonicity. Results of the study show evidence of definite relationship between psychoses and accompanying changes in the functions of the vegetative nervous system. [Author's abstract.]

Stuurman, F. J. Experimental Adrenalin Injections in Mental Diseases. [Psychiat. en Neurol. Bladen, May–Aug., Vol. 26, No. 3–4, p. 256.]

Stuurman reports the results of his researches on experimental adrenalin injections in ninety cases of mental diseases. After a hypodermic injection of 0.7 mgm. of adrenalin the systolic and the diastolic blood-pressure, and the pulse frequency, were taken every five minutes during ninety minutes; finally the urine was tested for glucose. As a rule the systolic pressure and the pulse frequency rises, while the diastolic pressure mostly falls. Glycosuria was found in about one-third of the cases. In anxiety sufferers the reaction was increased, even when a high blood pressure had been previously observed. On the contrary, in quiet melancholies the blood pressure was often low—contrary to former opinions—and the reaction to the injection sometimes very slight. It is necessary to compare the blood pressure of patients with those of persons of the same age, for the pressure rises with the age. The adrenalin reaction of schizophrenics did not differ definitely from that of other cases—as has for some years been asserted. Epileptics had, generally, a low blood pressure; the reaction to adrenalin was mostly slight as far as the blood pressure and pulse frequency were concerned, but was nevertheless strong as far as glycosuria was concerned. This finding appears to tell against Fischer's theory. In order to examine whether in anxiety (Augst) an increased adrenalin excretion was present as cause or as effect, a means was sought to counteract the action of adrenalin. It was found that two to six grams of sodium bicarbonate by mouth diminishes the adrenalin reaction. In some cases of anxiety the bicarbonate seemed to act favorably. The writer thinks,

therefore, that anxiety not only causes increased adrenalin excretion but also increases by the adrenalin activity. Many persons told him that after the adrenalin injection they had a feeling of oppression and slight anxiety: objectively it was then possible to observe heart-pulsations and tremors. [Leonard J. Kidd, London, England.]

Suttie, I. D. Psychopathology and Theory of Psychopathic (Germinal) Inheritance. [Jl. of Neurology and Psychopathology, Vol. 3, III, No. 9, p. 42. J. A. M. A.]

Suttie attempts to show that the neuropathologic theory of mental disease is associated with the hypothesis of its hereditary transmission. He thinks even that the two lend each other "moral" as well as logical support. He also indicates that the crucial test of the ultimate validity of psychopathologic interpretation is its ability to account for high familial incidence of the dsease-form to which it is applied. To hazard a tentative judgment on these lines, while presuming an agreement on the evidence, it might be said that as certain mental syndromes have no typical or integrated psychic aspect, but have, on the other hand, a demonstrably organic basis, it must be inferred that any hereditary relation is physical, and mutatis mutandis where no neural lesion or abnormality is discoverable. Thus mental defect is heritable; the psychoses are questionably so, with the exception of paranoia, which with the minor and anomalous neuroses are probably acquired.

Mignard, M. Organic States in Mental Derangement. [L'Encéphale, XVII, No. 5, p. 266.]

The author here discusses the interrelationships of somatic and psychical factors in the psychoses. The diseased organism is no longer able to serve properly the controlling mind. He regards this morbid interaction of mental modifications and neuroreflex functions as the capital fact dominating psychopathology.

Rutherford, H. R. C. Prognosis in Mental Disease. [Irish Jl. Med. Sc., April, 1922.]

The author had made an analysis of 1347 cases who had been discharged from the public mental hospitals of Ireland and also of 157 cases who had recovered in St. Patrick's Hospital of whom he had a more intimate knowledge. The two sets of cases had shown recovery rate of 37.8 per cent and 50.98 per cent, respectively, with a slightly greater percentage recovery rate among women as compared with men. The influence of age was investigated, and the least satisfactory age for recoverability was shown to occur within the age period twenty-five to thirty-four years, which is the least recoverable age period up to sixty-four years of age. One thousand sixty-seven out of 1347 patients had been discharged well within twelve months of admission. Another 127 were discharged during the second year and the remaining 153 were

spread over a series of years. In the author's experience the average length of illness for an acute case is four and one-half months. In the 157 cases recorded from St. Patrick's Hospital a further investigation had been made dealing with the clinical features of the illness, the periodicity of the attack and the association of an insane heredity.

For purpose of comparison a classification of states instead of entities was adopted. Sixty-three had come under the heading of depression, 56 were in a state of excitement. Delusional conditions accounted for 23 and confusion for the remaining 15.

Permanence of recovery was not to be found, as a rule, in mental disease, owing to the influence of heredity. Insane heredity was usually to be discerned in from 50 to 70 per cent of admissions. This heredity he regards as being purely of a hypothyroidal nature. He had come to this belief by the large number of patients, with an early psychopathic inheritance, who responded to thyroid treatment. Especially was this to be noticed in cases showing a family history of collateral heredity. The later hypothyroidal generations show dementia precox and imbecility, which conditions are accompanied by degenerative changes or undevelopment and these, the late administration of thyroid cannot remove.

He commented upon the influence of thyroid in the organism's growth and suggested that the want of durability in degenerated tissues was due to deficient thyroid, so that when strain came the affected organ failed. Hypothyroidism only acts as a predisposing cause, but whenever the exciting cause of the mental attack is a feeble one, the administration of thyroid will remove it. There is a marked association in both the insane and their relatives of tuberculosis, asthma, and malignant disease. The author suggests that defective thyroidal secretion might act as a hereditary and predisposing cause in these diseases also. [Author's abstract.]

Chapman, R. McC. Early Recognition of Tendencies to Mental Disease. [So. Med. Jl., XV, Nov.]

Chapman calls attention to the possibilities of prevention of the more serious mental disturbances through early recognition of bad tendencies, or beginning maladjustments.

Breukink, H. Treatment of the Insane in Former Centuries. [Ned. Tijd. v. Gen., Sept. 2, 1922, II, No. 10.]

A well illustrated historical study is presented by Breukink. He says that the first institution built in Europe exclusively for the insane was at Upsala, in the fourteenth century. The paintings and monuments reproduced testify that it was the medical profession that freed the insane from chains. A number of devices for restraint are pictured; the Amsterdam museum has a large number.

Gaupp, R. Case of Wagner. A Catamnesis Which Is Also a Contribution to the Theory of Paranoia. [Zschr. f. d. ges. Neurol., LX, 312–327.]

Gaupp has written of the famous case of the teacher Wagner, who in 1913 shot 14 persons in the South German village of Mühlhausen. He was interned in an institution under the diagnosis of paranoia. He has been isolated from other patients for six years and excluded almost entirely from influences from the outside world. Yet instead of the appearance of an "institutional blunting of sensibility" to be expected he is mentally fresh, alert, affectivity unweakened. He has built up further delusional ideas of various sorts but the delusion forming process of his pathological condition is only episodic in appearance.

Kastan. Significance of the Abderhalden Reaction in the Field of Psychiatry and Nervous Diseases. [Berlin Letter, J. A. M. A., Vol. 80, Dec. 9,]

It was formerly thought possible to distinguish defect psychoses from other psychoses by means of the dialyzation method; dementia precox, especially, was regarded as being diagnosticable in this manner, but more recent investigations tend to disprove this assumption. Kastan refuses to accept the theory of a special dysglandular psychosis. The notion of dysfunction is not clear clinically. The Abderhalden reaction does not prove that the organ which gives evidence of perverted metabolism is the one in which the pathologic changes first occurred; for the former may have been damaged by psychic influences. The results Kastan has reached through his own researches may be summed up thus: Eleven per cent of his cases of manic-depressive insanity were found to be due to psychic enfeeblement and deterioration of the gonads; in eighty-seven cases of dementia precox he found twenty-seven instances of deterioration of the thyroid gland, sixty instances of deterioration of the gonads and thirty examples of cerebral deterioration; in twelve cases he found deterioration of the brain, the thyroid and the gonads, and in nine cases no positive results were secured. He found cerebral deterioration in 33 per cent of the epipleptics examined, but noted no wealth of peculiar (*eigen*) dialyzable substances. In paresis he observed cerebral deterioration in 40 per cent of the cases. Following the Steinach operation in dementia precox there were no changes in the Abderhalden reaction. However, the reaction has had a theoretical value. It has led to viewing from a common angle all processes in the body associated with psychoses.

Robertson, George M. The Hospitalization of the Scottish Asylum System. [Jl. of Mental Science, Vol. 68, Oct.]

For more than a generation the dominating motive of the asylum authorities in Scotland has been to make the asylum an institution conducted on the same medical and nursing methods as those in general

hospitals. First, the elimination of prison-like features had to be effected and as a beginning airing-courts and high investing walls were abolished. Exercise was given on walks round the extensive grounds. Then followed the system of nonrestraint and the abolition of straitjackets, gloves, the "padded room" and of confinement in single rooms either by day or by night. These mechanical safeguards were substituted by continuous and efficient nursing supervision. Finally, the open-door system was introduced and the number of locked doors reduced to a minimum. Secondly, in regard to the introduction of hospital features, the first advance was the establishment of the separate hospital block for all patients suffering from recoverable insanity and all those suffering from bodily illness. Following on this came courses of instruction and training for mental nurses. Another advance was the appointment of hospital nurses as matrons of the female divisions after they had received the required mental hospital training. Attention next turned to the question of the management of the male insane by female nurses. It was soon found that the hospital block, already referred to, could be staffed by women. Later it was noticed that women possessed more control than men over male patients who might be thought unsuited for their care. So that finally the system emerged of a complete female staff aided by males under certain necessary circumstances and headed by a matron. The effect is that the tone and whole atmosphere of the institution is different. It is at once more human, more sympathetic and more medical.

Allers, R. Psychogenic Disturbances in a Foreign Language Environment. [Zschr. f. d. ges. Neurol., Vol. LX.]

The writer reports three soldiers under his care during the war who could not make themselves understood because of their inability to speak the language. They gave evidence of a depressive anxiety state of mind with paranoid hallucinatory symptoms. He concludes that there is a delusion of persecution with the one isolated in speech similar to the prison psychosis and the psychotic disturbances of the deaf.

Echols, George L. The Mental Disease Problem. [Georgia State Med. Ass'n Jl., Aug., 1922.]

More than one-half of the hospital beds of the United States are occupied by patients suffering from mental disease. About 50 per cent to 60 per cent of the inmates of penal institutions are suffering from mental disease or defect of some type. Of the ex-service soldiers now hospitalized one in three is a neuropsychiatric patient. One-tenth to one-fifth of every state's expenditures is for the support of mental hospitals. There are more mental patients in the public institutions of the country than there are students in its colleges and universities. The individual suffering, and the worry and anxiety of relatives and friends

deserve consideration. The individual and family economic loss from mental disease could hardly be calculated.

Present methods include too much *jail and asylum;* and to reach the latter, the usual route is *via* police station, sheriff, jail and court. Branded as crazy, taken in custody by an officer of the law; passed through a court or commission trial to make his incarceration legal; and by the time he reaches the institution physician he is suspicious, non-coöperative and rebellious. The institution physician is usually burdened with two or three times as many patients as he should have in his care, and this usually necessitates hurried examinations—at stated intervals, reëxamined and his conduct noted. The patient to a great extent is left to associate with the chronic insane, and naturally loses hope and interest.

The people must be led from the old *asylum idea,* and given a vision of the hospital for mental diseases. Get them away from the thought that an individual is *insane* or *crazy,* and regard him as *mentally sick.* Physicians must grasp the truth that certain types of mental disease are as treatable as certain types of physical diseases.

The most treatable stage in mental disease is not seen, studied or treated by the physicians doing mental hospital work, as they deal more with the fully developed psychosis.

One of the great fields of preventive medicine lies in the pre-psychotic and early psychotic periods. This period is usually in the hands of the family physician.

Every physician—regardless of specialty—should buy a textbook on mental disease, and study the same. Medical colleges should give thorough courses in psychiatry. State Board Examination Laws should be amended so as to include psychiatry. Large cities and medical schools should maintain mental clinics. Every state hospital without exception should maintain an out-patient department where suspected cases may be brought, their trouble talked over, and receive expert advice as to rest, treatment, commitment, etc. The commitment should be voluntary as far as possible, so the patient may come in with a full realization that he is mentally sick, and the great consideration is a mental improvement or mental recovery. [Author's abstract.]

Book Reviews

Jackson, J. Hughlings. Neurological Fragments. With biographical memoir by James Taylor, and including the Recollections of the late Jonathan Hutchinson and Charles Mercier. [Oxford University Press.]

It is a long lane that hath no turning and finally at this late date some more of the interesting work of Hughlings Jackson has been collected in compact form. Sir Henry Head published in *Brain* some years ago the most outstanding of Jackson's works on aphasia and these Fragments make a worthy companionpiece to the effort of Head to show how valuable Jackson's mode of thinking still could be on neurological problems.

In this delightful collection of a series of observations which he called Neurological Fragments one can see the synthetic faculty that Jackson always showed to formulate something of value from his analysis of symptoms. The volume is furthermore enhanced in interest by the biographical details of Taylor, Hutchinson and Mercier.

This is surely a volume all neuropsychiaters should have on their shelves.

Bernfeld, Siegfried. Vom dichterischen Schaffen der Jugen. [Internationaler Psychoanalytischer Verlag, Leipzig, Wien, Zurich.]

In all new as well as old endeavors claimants arise to grasp the laurel leaves of supremacy—or any other metaphor that one may think of, whether it be Robt. Edmond Jones in the scenic theater or Basil Sydney as a new Hamlet. In the psychoanalytic horizon Siegfried Bernfeld has appeared as a luminous star and this his sixth expression of his productivity.

Speaking purely in personal terms, the reviewer was much impressed by the fervor and directness of this young man's presentations at the last psychoanalytic congress in Bad Homburg and has been able to feel himself into the work under consideration by reason of this reassurance of the integrity and fire of the observed performances of the author.

From the earliest days of a far remote past observing mankind has emphasized the obvious; that the child of to-day is the adult of to-morrow, and as "the twig is bent the tree is inclined"—hence the supreme importance of early impressions.

Bernfeld here deals with the poetic accomplishments or deeds of children in their relation to an understanding of child psychology. No formal psychology this—rather a sympathetic reaching into the

child soul even though it divides itself into a series of formal presentations of individual accomplishments.

In order to orient the reader to the situations outlined the author first gives us a complete synopsis of previous work—manifestly to cover the entire field of all the poetic prodigies would be impossible. He then takes up a series of observations of young people who have shown certain predilections for poetic expression. Here the semi-German understanding reader is at considerable loss. Walther-Caset cannot be summarized. He serves as a sample for further study of the many interesting problems why one writes lyrics, another dramas, another some other form of literary expression. These and related problems are most interestingly touched upon by the writer.

It can well be understood why old codgers who are satisfied with having made their pile will not be interested in this type of problem—but with the Russian Revolution right under our noses maybe it may be of more than passing interest to note what is going on as an expression of creative interest in the youth of our country. This volume will certainly be of service in directing the still young in seeing into the spirit of creation.

Freud, S. Collected Papers. Vols. I–II. [Hogarth Press and the Institute of Psycho-Analysis, London.]

Two volumes of the Collected Papers of Freud are here available in English. In spite of the fact that a number of Freud's larger works are available in this language, the greater and really more important part of his writings have had to be consulted in German.

Thanks to Dr. Rivière, who has supervised the translations—made by a number of authors—we have a homogeneous presentation of many of the smaller but highly original contributions of Freud.

In Vol. I are to be found the early papers. It is only by the reading of these papers one can really get a glimpse of the early history of the development of the psychoanalytic theory, the beginnings of which were back in 1893. Parenthetically much of the lay psychoanalytic stuff dates back here thirty-three years old. As one reads these papers one can see the expanding vision of Freud. The laying aside of certain formulations and the strengthening of others may be found in the rapid growth during the first ten years practically covered by the first three hundred pages of the volume. The remainder of the book is a new edition of Freud's History of the Psycho-Analytic Movement. A number of important additions and clarifications render this a different volume than that issued by the Nervous and Mental Disease Monograph Series, and hence lend additional interest to Vol. I.

Vol. II contains thirty-four papers. Of these twenty-four deal with clinical cases and the remainder are Freud's contributions to Technique. This collection follows no time schedule but contains early and late papers—some of Freud's most recent contributions (1924) are contained herein, particularly his most suggestive ones upon Neurosis and Psychosis, The Economic Problems of Masochism and his Passing of the Œdipus Complex.

The collection of papers upon Technique is specially welcome. These studies are not to be interpreted as any systematic presentation but are so full of suggestive, thought-provoking material that no worker in psychoanalysis can afford not to know them.

We shall look forward to the completion of this series of collected works and can cordially recommend the excellent translation and editorial workmanship.

v. Economo, Constantin, und Koskinas, G. N. Die Cytoarchitektonik der Hirnrinde des erwachsenen Menschen. With an atlas of 112 microphotographic plates. [Julius Springer, Berlin and Vienna, 1925.]

A cursory acquaintance with this monumental work discloses it to be dedicated to the "problem of problems." The steady friendship of a generation of neurologists will teach how salutary has been the offering. Throughout our era the notion of the brain as the prime seat of human characteristics has been diversely the subject of philosophic vagaries, religious bigotry and moral dogma until, with the phenomenal rise of material science in the last century, the objective study of the question was undertaken. Even Gall, that fantastic anatomist, was so objective as to be expelled from Vienna for his intellectual heresy. But with Meynert and the Kiev scientist Betz, definite steps were taken toward the morphologic studies which find their fullest fruition in the work at hand. The banner of physical science has been changing its colors latterly under the direct rays of the sun of psychological points of view; but out of the same environment whence sprung our deepest and most widespread psychological methods has come this solid contribution to the objective morphology of the cortex.

From Meynert and Betz and Bevan Lewis down, the principles have been steadily preserved. Upon these foundations the labor has been an unceasing one toward an exhaustive analysis of the objective structures present. Whatever may be the changes and reactions of scientific and philosophic opinion this tradition has afforded us an unqualified fund of facts upon which those opinions concerning the composition of human characters must be based. The authors have manifestly embedded their work in that tradition and have built, for cytoarchitectonics, a keystone of exactness and completeness. The cardinal test of this work, as of any other scientific effort, will be found in the extent to which it matches up with the manifest characteristics of man and with the positive results of other carefully directed researches. The position has been well expressed by some of our neuropsychiatrists that any two exact approaches to an object must eventually lead to the same results, and that a final science of human character must include the spirit of him as well as his flesh. Within the province of objective neurology there have been two fundamental methods of study and, more recently a third, with results commonly corroborating each other. Whatever synthesis the future of psychopathology offers us, these studies are definitive.

In turning to the work one catches the spirit of objectivity in its

most striking modernity. The 800 page text is divided into a general and a special part, the latter section describing and analyzing in systematic and comprehensive detail a separate atlas of 112 immense photographic plates. We can hardly be more truthful than a photograph, especially when we do not retouch as the authors assure us they have not done. The atlas is not only the most important part of the work, but it is an innovation born of foresight and a desire for perfection. After carefully approaching the facts according to the method minutely detailed in a special chapter, they were photographed in 50× enlargement. These were then doubled to 100× by magnification of the plates and the enlarged but unadulterated truth was plain for anyone to see and to compare. The result is that a section of the cortex normally about 3 mm. square appears upon a faultlessly clear plate about a foot square. Each plate is further bounded on three sides by millimeter scales included in the photograph (in order that any distortion of the truth by fixation methods might equally distort the rule of judgment); so that, by a simple calculation, one easily arrives at the normal size of any distance on the plate, the spatial relations of the particular slide in the brain, or the actual number of cells de norma. The atlas is not less than a norm of the cellular and areal anatomy of the brain.

The text matches the atlas in a continuation of its thoroughgoing objectivity and particularly in its leisurely comprehensiveness. Following a historical and systematic introduction in which the authors, ever consistent, refreshingly return credit to those who deserve it, there are exhaustive chapters on the morphology and relation of the cells, the development of the forms of cortical tissue to be discussed, and the anatomy of the various layers of the cortex with a view to their differentiation. In regard to the number of layers of the cortex and the question of the morphological types, the authors compare their own studies and plates with tradition and find that they can serve both without deviating from their goal. Since the days of Bevan Lewis we have accepted the six layered cortex and the atlas magnifies the verification beyond doubt. The subdivisions of each layer are here continued as such. The morphological division of the cortex as a whole into two types has its origin in Brodman's comparative studies. The authors accept Vogt's terminology for these types but adduce a complete series of their own sections and several plates to illustrate the validity of the iso- and the allocortex. The results of myeloarchitectonics are drawn upon for further corroboration and also the comparative studies of Chr. Jacob which led the latter even beyond this goal. The isocortex is the normally six layered mantel whose greater or lesser variations from the type are hetero- or homotypical. This type of cortical formation is found in the preponderating mass of the brain surface with the exception of the primary olfactory brain and the parts derived from it. These latter possess a cortical formation of another order and constitute the allocortex. When Jacob goes on to divide the isocortex further into an outer and an inner layer, the former sensory cortex, the latter motor, the authors agree to the ingenuity of the conception—

and leave the decision to future corroboration. They themselves adduce evidence to show however, that the allocortex is laid down in the third month about three months prior to the isocortex and permit themselves the opinion that the same concurs with the rudimentary and primitive differentiations of the allocortex.

In continuation of the tradition of areal differentiation the authors have raised the number to 76 more or less definite fields, and 107 when the major modifications are included. Brodman had raised Campbell's 29 to about 50, but the authors expect to see their own number increased and verified by an even greater intensification of the microscopic method. There is no reason why this should not be the case given these premises and the method, and those specialists who deplore the search for the last cortical area have apparently failed to draw the full consequences of their scientific position. On this point the atlas speaks clearly enough and the text offers several schematic maps.

These areas are, however, specific only in respect to their immediate vicinity. In the isocortex they generally disclose one or another of five types of layer formation and it is the distinguishing contribution of this work to have introduced this morphological basis. The broad banded, agranular type of cortex possesses large pyramidal cells (apart from the Betz giant cells) and a well developed sixth layer, but very few granular cells, and is found in the precentral gyrus, the posterior ends of the frontal lobe, and medially. The second or granular pyramidal type, possesses a better development of the second and fourth granular layers and is found parietally and on the median wall. This type often forms a combination with type 1 as in the whole second and third temporal lobes, the operculum, and the gyrus postcentralis. The third, or parietal type, discloses an even greater development of the granular cells. At the very frontal pole as well as occipitally is the polar type of cortex, thin banded and filled with small cells. The occipital as well as the medial lining of the calcarina and a stripe along the inner wall of the hippocampus possess the completely granular or koniocortex, the archtype of sensory cortex denoted by Meynert. The relation of the areas to these five basic types of lamellated isocortex is then in the nature of a metamorphosis from one type into another or within a type, changes sometimes slight and at other times more abrupt. The distinction of these areas has always been a matter of much individual appreciation, and one could reasonably expect to catch impersonal research in a bad corner. True, we are not enlightened by a mathematical system whereby to get around this difficulty. The authors are fully aware of this personal moment, but they define with exemplary accuracy the microscopic elements by which alone they arrive at such distinctions.

In the wealth of detail amassed in the special section there is still evidence of an orderly review of the material. For each separate area there is a regular plan of paragraphic analysis and it is especially in the paragraphs on the physiologic importance of the areas

described that the authors display an enviable regard for the difference between fact and fiction. They are at thankful pains also to circumscribe the limits of any sort of objective research in regard to the cortex, reflecting a thorough acquaintance with the psychologic point of view in neuropsychiatry. The inaccurate use of the word "specific" in regard to cells as, for example, "specific visual cells" is shown to be misleading and valuable only in so far as the cells are considered to be of a specific morphologic type. The specificity of vision is as yet beyond the microscope. The question of localization in respect to the major sections of the cortex is delicately handled in view of the insecurity of that topic since the work in encephalitis and the aphasias. v. Economo's own previous studies have done not a little to disclose the importance of the subcortex in cortical physiology and he further concurs in the conclusions of modern psychiatry that many functions are hardly to be localized at all except in the organism as a unit. Wherever the clinical and pathological data are well enough arranged, however, the authors do not hesitate to bring them into relation with the anatomy of the areas in question.

At every point the work has lived up to its tradition and its premises and is in every way a *Realencyclopedia* on the study of the cortex. The authors are at pains to advise methods and have forestalled errors in technic and measurement. Wherever their researches lack the backing of experimental study they are quick to report the necessity of it and suggest at length not a few paths which must lead to a correlation between several methods of research and their own. The format of the work is in just proportion to the dignity of the object and wherever research is being done on the brain it will be a steady guide.

Kappers, C. V. Ariëns. Tabulae Anatomo-Comparatival Cerebri. [The Kosmos Publishing Co., Amsterdam. $20.]

This interesting series of maps, nine in number, of large size, fitted for wall hanging and admirably adapted for teaching purposes, are intended to give a rapid and yet complete survey of the phyletic development of the fiber systems and nuclei as seen in sagittal section.

Different receptor functional systems are represented by different colors and thus the intricate course of the connections and the evolution from simple Amphioxus, through Petronyzu Scyllium, Periophthalmus, Rana, Varanus, Gallus, Onychogale (marsupial) to Homo, are most strikingly developed.

These tables are founded upon Kappers' Vergleichende Anatomie and cannot be praised too highly for their accuracy, and especially for the skill with which the author has brought out the most salient features and made them available especially for purposes of demonstration.

Inasmuch as the genetic mode of approach to all neuropsychiatric problems has offered so much this series of charts will be a great help to the teacher and student of the anatomy and functioning of the nervous system. No teacher can afford to be without them.

Obituary

DR. HENRY RUST STEDMAN

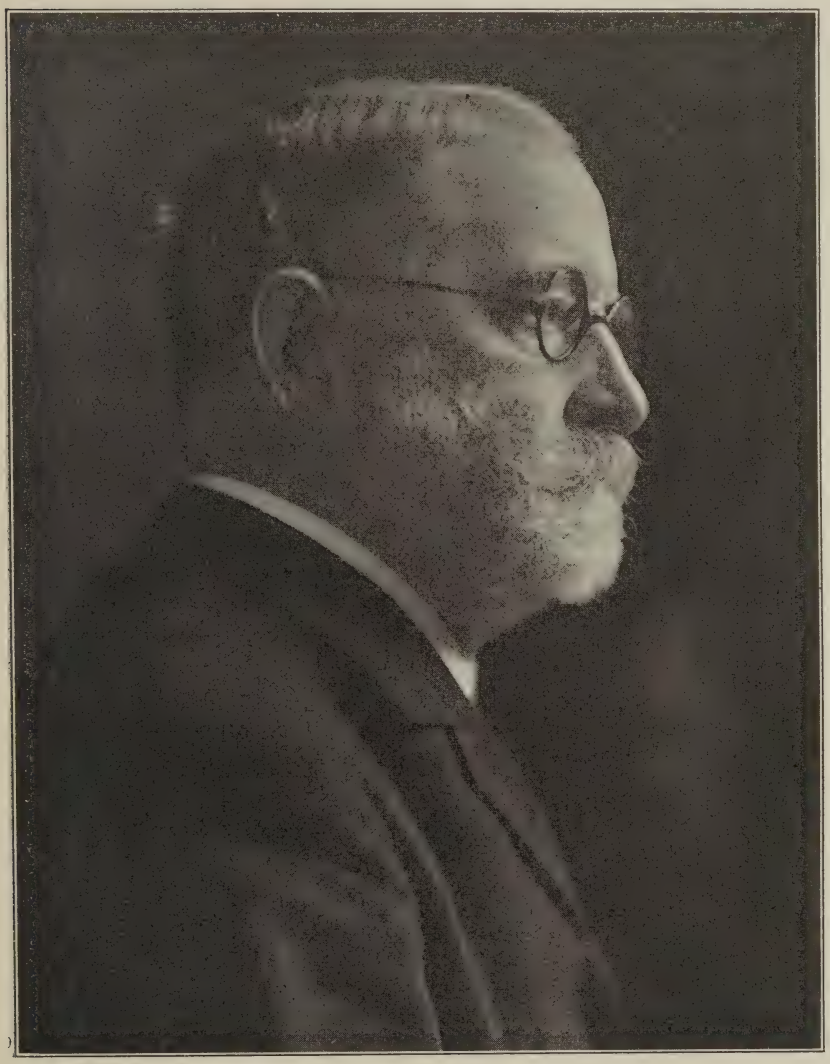
Dr. H. R. Stedman, long associated with the best traditions of Boston medicine and American psychiatry, died February 19, after an illness of several months. He was born in Boston, September 19, 1849, son of Dr. Charles H. Stedman and Lucy (Ingalls) Stedman. His grandfather, brother, and an uncle were also physicians. He was prepared for college at the Boston Latin School, entered Harvard College, graduating in the class of 1871, and later taking the degree of M.D. at the Harvard Medical School in the class of 1875. He served as a surgical house pupil at the Massachusetts General Hospital, and also had a medical service at the Boston City Hospital.

Early in his medical career Dr. Stedman took up the practice of psychiatry, which became his life work. To perfect himself in this field, he served first as assistant superintendent of the Danvers State Hospital, and later became an assistant in the Edinburgh Royal Asylum and the West Riding Asylum at Yorkshire, England, where he came in contact, to his lasting benefit, with the leaders of psychiatry in the British Isles. His reminiscences of these early days were always a delight to his associates.

He established, in 1884, a hospital for the private treatment of mental disease at Forest Hills, a suburb of Boston, later removing to Brookline. To the interests of this hospital, accommodating not more than twenty patients, he devoted much of his time and thought for thirty-four years. Toward the latter part of this period, feeling with advancing years the desirability of sharing the responsibility, he took as his associate Dr. George H. Torney, to whom he finally relinquished the management of the hospital, but not his interest in its progress and welfare. It will long stand as a monument to his ideal of what such a hospital should be, a refuge for the mentally afflicted, approximating as closely as possible the conditions of their homes.

His devotion to the development of this hospital rather stimulated than discouraged his interest in the wider problems concerning the care of the mentally disordered and his work toward a better understanding and more sympathetic treatment of this class of maladies stands out as one of his preëminent achievements. Many of

the measures which are now accepted without question or dispute were met with indifference if not actual opposition forty years ago. The pioneer work which he did should not be forgotten or under-



HENRY RUST STEDMAN, M.D.

estimated. The question of "state care," and the discussion which led up to it, absorbed much of his time and energy. He made a series of visits to city and town almshouses, and unearthed many defects

and actual abuses in the custodial type of treatment then in vogue. This was a thankless task, well and courageously performed. It has resulted in the exclusive adoption of "state care" for this type of dependents.

In 1909, Dr. Stedman was appointed by Governor Guild a member of a State Commission to revise and codify the laws of Massachusetts concerning the insane. From the efforts of this commission, a beginning was made toward a proper examination of the mental condition of criminals. Another matter to which he gave much thought was a plan for boarding out certain of the mental patients from institutions, a step toward a more rational attitude regarding the whole problem of treatment. From the first he identified himself with the mental hygiene movement in Massachusetts and in the country at large, and saw in its growth a sure sign of a better lay understanding of the problems of mental disease. He was one of the founders of the Monson State Hospital for Epileptics, thereby establishing separate care for this unfortunate class of patients, and an ardent advocate of "after care," a precursor of the "follow up" system, which the social service movement has done much to foster and develop. Although he never sought distinction as a medico-legal expert, he was not infrequently called upon to testify in civil or criminal cases involving questions of mental responsibility. In general, it may be said of him that he combined in unusual degree interest in the individual patient under his supervision with the broader social and political aspects of mental defect and delinquency. It was a constructive period, and he did much toward building the present stable structure, which happily he lived to see realized.

Dr. Stedman's medical writing, though not extensive, was always characterized by extreme care in presentation, and many of his papers stand as the first expression of the reforms in which he took so keen an interest. Among these papers may be mentioned "The Family System as an Accessory Provision for Our Poor," published in 1890, "The Need of Popular Lectures on Insanity," in 1897, "The After-Care of the Insane," in 1899, "A Programme of Practical Measures for Mental Hygiene Work," in 1914.

For upward of twenty years, he was a trustee of the Taunton State Hospital; he was a member of the American Neurological Association and its president in 1906; he had also been president of the Boston Society of Psychiatry and Neurology, and of the New England Society of Psychiatry, director of the Executive Committee of the Massachusetts Society for Mental Hygiene, and a member of the National Committee. He held a membership also in the American

Medical Association, the American Psychiatric Association, the New York Psychiatric Society, and the Massachusetts Medical Society.

Dr. Stedman stood for all that is best in medicine. His devotion to psychiatry, during the dark days of its claims for recognition as an integral part of medical science and practice, materially helped to bring the subject into its legitimate relation to medicine as a whole. He saw the wide implications of psychiatric research and did his share toward making possible the development of later years. Personally he was modest, somewhat self-depreciatory, generous to a degree, a good and lasting friend to young men, and a loyal colleague—a man of rare and sterling qualities. He married Miss Mabel Weiss in 1879, who up to the time of her death in 1917 was an unfailing source of help and encouragement in the solution of the many problems which met him in the course of his professional life. He is survived by a son, John W. Stedman of Morristown, N. J., and two daughters, Mrs. Albert Hale and Miss Anne Bradstreet Stedman, both of Brookline.

E. W. T. (*Bost. Med. Jl.*)

HENRY RAYNER, M.D., M.R.C.P.Ed.

By the death of Dr. Henry Rayner, formerly Physician for Mental Diseases, St. Thomas' Hospital, on February 8, at the age of eighty-four, England has lost one of its veteran and most highly esteemed psychiatrists. Dr. Rayner received his medical education at St. Thomas' Hospital and the University of Aberdeen. In 1864 he obtained the diplomas M.R.C.S.Eng. and L.S.A., and graduated in 1866 M.B., C.M.Aberd. with highest honors, proceeding M.D. in 1870. In 1878 he became a member of the Royal College of Physicians of Edinburgh.

After serving as resident assistant physician at Bethlem Royal Hospital Dr. Rayner decided to specialize in psychological medicine, and was appointed out-patient physician for mental diseases, and lecturer in this subject, at St. Thomas' Hospital, where the organization of the mental clinic nearly fifty years ago was mainly due to him. He was also for some time lecturer on mental diseases in the Middlesex Hospital School, and for several years he held the responsible post of medical superintendent of the male department of the London County Council Asylum at Hanwell. During the war he acted as consulting physician to the "Recuperative Homes" at Hampstead, established by Sir Frederick Milner for ex-service men

suffering from nerve diseases. In 1870 Dr. Rayner became a member of the Medico-Psychological Association of Great Britain and Ireland; he was elected general secretary in 1877 and president in 1884. He was co-editor of the *Journal of Mental Science* from 1895 to 1911. His literary contributions to psychological medicine were very numerous and varied; they include an article on "Melancholia and Hypochondriasis" in *Allbutt's System of Medicine,* on "Sleep and Narcosis" in the *Journal of Mental Science* (1902), "Early Treatment of Mental Defects in Children," "Gout and Insanity," and "Moral Insanity."

For more than a quarter of a century he was chairman of the council of the Mental After-Care Association for poor persons convalescent or recovered from institutions for the insane, which has rendered most valuable assistance by enabling a large number of convalescent mental patients to take up again active life in the community without relapsing.

Dr. Rayner was deeply interested in horticulture, and his family residence at Hythe, in Kent, is noted for its gardens. He was a sturdy pedestrian, and in his younger days possessed considerable golfing abilities. (*Br. M. Jl.*)

ALBERT POLON, M.D.

1881—1926

On March 15, 1926, Dr. Albert Polon suddenly died of coronary thrombosis at the age of forty-five. He had been ailing for years from essential hypertension which showed itself mainly in intractable headaches; but occasional precordial distress betrayed the cononary disease which caused his untimely death. He "fell asleep" in his chair while talking to a patient.

Dr. Polon was born at Elizabethgrad, Russia, on January 1, 1881. He attended the secondary school, or Gymnasium, up to the age of eighteen when he went to Vienna. After studying chemistry for one year he left for America and arrived in this country in 1900. He became a registered pharmacist, practising his profession up to 1906 when he entered Cornell medical school from which he was graduated in 1910. He served as an interne at the Montefiore Hospital for two years, then began the practice of general medicine. From the beginning he paid considerable attention to neurology and especially to psychotherapy for which he early showed marked inclination and special aptitude. Meanwhile he was connected with the neurological

department of the Mount Sinai dispensary and later with that of the Vanderbilt Clinic. In 1921 he went to Vienna where he was analyzed by Professor Freud. After a stay of one year he returned

Albert Polon, M.D.

to New York City and devoted himself exclusively to the practice of psychoanalysis. Keeping up his interest in neurology he continued as attending physician at the Vanderbilt clinic and in 1924 was

appointed Instructor of Neurology at Columbia University. He was a member of the American Psychoanalytic Society and of the New York Psychoanalytic Society, of which he was secretary at the time of his death.

In the few years that he practised psychoanalysis Dr. Polon gained for himself a commanding place among his confrères. He knew the theory and practice of psychoanalysis as few other men did and had a gift for exposition which was unusual for its lucidity. Those who heard him were immediately impressed by his sound intellect and keen power of logical analysis. Added to this he brought to psychoanalysis considerable knowledge of literature, a sound acquaintance with philosophy, sociology and psychology, good training in medicine, neurology and psychiatry, an excellent insight into human nature and a love for his chosen field. It may be said that he was ideally fit to practice psychoanalysis.

Although he did not write much he contributed a number of papers, among which may be specially mentioned The Theory of the Neuroses and the Development of Psychotherapy which are hardly surpassed for lucidity of exposition. Just before his death he read a paper on Anxiety, containing the germ of an original contribution.

In the death of Dr. Polon psychoanalysis in America suffered a grievous loss. He had unusual powers and his unbounded energy promised much for the future. Because of his intensely social make-up Dr. Polon had a host of friends, many of them heartily devoted to him. To them his death leaves a void which nothing can fill. His gift for conversation and fine sense of humor were a constant source of pleasure not only to his friends but to all who came in contact with him. He is survived by his wife and two children, a boy of nine and a little girl of not quite two years.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

Vol. 63 JUNE, 1926 No. 6

The Journal

OF

Nervous and Mental Disease

An American Journal of Neuropsychiatry, Founded in 1874

Original Articles

BERGSON'S CONCEPTIONS AS APPLIED TO PSYCHOPATHOLOGY

By Dr. E. Minkowski

of Paris

AUTHORIZED TRANSLATION

By Frederic J. Farnell, M.D., F.A.C.P.

Providence, R. I.

It is customary to warn not only the psychiatrist, but also the psychologist against the dangers of philosophy. There is good reason evidently for such advice. To-day, the observation of facts by abstract speculations cannot be practiced as it has been done formerly.

After reflection, however, matters become complicated. To begin with, the observed fact, the supposed starting point of all empirical science, is not given to us as such. Already it presents the result of a certain confusion, for, we might say, we always analyze it in parts, in its continuous movement, which is life.

It is well never to forget so important a fact, where system is concerned. Otherwise, in complying with the urgent need of generalization which guides our ideation, one risks the arrival at a conception of a general order, which, in exceeding the limits of the initial analysis, can only falsify realities. Those conceptions are placed parallel with the essential factors of life, they are the very ones which have been left outside of that part of reality, which is constituted of "observed facts" for the purpose of a particular science. The initial analysis while determining the general character of this science imposes limits upon it. The point is not to forget the existence of those limits, or better still, to try and make them precise, surely a burning and difficult problem.

Experimental psychology and physiological psychology have had their hour of triumph. They prided themselves in being able to express their results in the manner of the physical sciences, in curves and in figures, or to reduce all the manifestations of psychic life to physiological mechanisms evolved in the nervous centers.

But we know to-day that such methods can consider only those elements of psychic life that are just accessible to experiment or which can be expressed in curves, or which present at least a certain similarity with facts of a physiological order. They do not go beyond that. A big fraction of psychic reality, and not the least essential, remains outside of their domain. Having been heedless of these elementary truths many psychologists and many psychiatrists have fallen into a gross materialism, putting their pupils on guard against the dangers of philosophy and remaining profoundly convinced of having succeeded themselves in avoiding this peril.

The question of voluntary movement has become the basis of the study of our psychomotor activity. One has attempted, also, to observe the volitional manifestations from that standpoint. But have we ever, in our lifetime, desired or wanted so stupid a thing as to raise our arms or move our legs? Certainly not. Our volitions always go into space, above our personal self, while fixing a goal outside of ourselves. That constitutes one of their essential characters. It is only when cutting off that character that we arrive at the conception of voluntary movement, a fact very useful in psychophysiology, but *a priori* entirely insufficient where the matter in question is to study and understand our activity in its elementary relations with environment.

In psychology, we have tried to look upon the human personality as a group of sensations, perceptions, ideas, sentiments and volitions. We make a sort of mosaic of them, composed of those diverse elements, and then we entirely neglect their organization for the time being. Thus, one of the most essential and irreducible factors of our life was left aside. We wish to speak of the necessity of progress; a powerful lever of our activity, for who has ever perceived in himself, a sensation, a desire, or an isolated volition? All those elements proceed uninterruptedly and mutually integrated into one another.

Any fixed goal has, when at first considered, only a provisional value, for virtually, even before having reached it, for the time being, we have already gone beyond it. We fix the goal, but simultaneously we look ahead in our constant quest for motion and progression. Every personal work has a value for us only inasmuch as it permits

us in our desire to do better. Stop for an instant in life, look back and ask yourself what you have done thus far. You will see an emptiness behind you, if a new desire, or a push toward the future does not come to revive you with its bright glare all the hopes, all the efforts of your past are lost.

Those few examples show us that whatever may be said, it is impossible in psychology to avoid philosophical peril, if peril there is. Psychology or psychiatry cannot do without philosophy, at least where system is concerned. But to use system in that domain—is it not to almost touch the most palpitating problems of our science, the greatest mysteries of the human soul?

From the moment that we cannot do without philosophy would it not be much more consistent to recognize it than to fall more or less unconsciously into the errors of conceptions of a horrible naïveté which are gratified easily by varied epithets such as "empirical" or "natural," epithets designed, at the most to cover the authors' ignorance and the lack of their sense of criticism, thus believing they are given great value. Psychology, psychopathology, only gain in contact with philosophy, for all true philosophy is an inexhaustible source of psychological observations and knowledge.

If the least doubt could exist, Bergson's works should dissipate them instanteously. Psychological questions of the best type and philosophical considerations are herewith so intimately bound, that we ask ourselves if we have a psychological or philosophical work before us.

We cannot here offer Bergson's ideas in detail. That, however, is hardly necessary. These ideas have expanded with an exceptional rapidity and have exercised their influence on divers domains of our knowledge. Let us simply recall here the fundamental opposition between intellect and instinct that Bergson establishes. While instinct is molded on the very form of life, intellect, on the contrary, is characterized by a natural incomprehension of the life. Intellect, just as it comes from the hands of nature, has the solid and unorganized for its principal object. It clearly represents to itself but a discontinuance and immobility. It is at ease only in the dead. It invariably behaves as if it were fascinated by the contemplation of the inert matter. Hence, its astonishment when turning toward the living it finds itself facing organization.

"Precisely because it is always trying to reconstitute, and to reconstitute only with what is given, the intellect lets what is new at each moment of a history escape. It does not admit the unforseeable. It rejects all creation."

"Thus concentrated on what repeats itself, solely preoccupied in uniting same with same, intellect turns from the vision of time. It rejects anything fluid and solidifies everything it touches. We do not think of time as real, but we live it." [1]

Psychopathology could be brought, sooner or later, to ask the question as to whether Bergson's conceptions were not capable of throwing a new light on the problems which heretofore the usual psychological interpretations had failed to illumine. At the same time the idea would be to see at what point the pathological facts would corroborate the given facts brought into evidence by the genial intuition of the great philosopher. Such an intention is only natural.

The morbid processes, very often, while acting in an elective manner, disassociate, we might say, the different functions and show them in a pure state.

Pathology very often succeeds where physiology does not succeed in untangling all the complex factors that enter into play. In life, intellect and instinct, or in other words, our psychic factors related to the solid, the inert and to space, on the one hand and those related to the continuity of time lived on the other, mutually blend and form a harmonious whole. Insufficient by itself to assure the existence of the individual, each of those two groups of factors complements the other while limiting, in a natural and appropriate manner its field of action. But cannot that harmony suffer a notable perturbation under the influence of pathological manifestations? Cannot the instinct for instance be injured in its beginning? In that case will not the intellect, deprived of its natural check, take on a monstrous disproportion and thus will it not, good or bad, seek to fill up the hole made by the failing instinct? Cannot the elements of intellect be in inverse ratio to the basis of the primary lesion, with secondary conservation or deformation of the factors relative to duration? Such are the questions that present themselves. These questions open a wide field before us, and as we shall see later, they lead us not to abstract speculations, but to nothing else than facts—to facts that until now have been neglected, not being understood through the usual manner of facing psychologic phenomena.

We will first compare the two great mental processes that psychopathology has until now separated; we mean the schizophrenic process and the intellectual weakness,[2] both of which end in specific

[1] H. Bergson. Creative Evolution. Pp. 166, 168, 175, etc.

[2] See concerning this subject: E. Minkowski et M. Tison, "Consideration sur la psychologie comparee des schizophrenes et des paralytiques generaux," Societe de Psychiatrie de Paris, Fevrier, 1924. Journal de Psychologie.

terminal states. So many authors have lately insisted on the fundamental difference of those two great groups of morbid processes. In spite of the evidence of that difference, however, it is not very easy to make it clear.

We can easily, without inconvenience, define intellectual weakness as the loss of judgment and memory. But such is not the case for schizophrenic deficiency. That is an altogether different question. The word "insanity" still sometimes employed hardly translates the essential trouble of the schizophrenic. Often one is surprised to find "under a demented envelope" the intelligence of those patients much less affected than one would believe, as if only "asleep" (Chaslin). "Even in an advanced case of schizophrenia, all the elementary functions of mentality, inasmuch as they are accessible to exploration, show themselves to be intact. Most particularly, memory is conserved in the schizophrenias, contrary to the real dement" (Bleuler). And still those "patients" "are compelled in appearance very often, to lead a purely vegetative and automatic life, such as idiots."

What do they lack?

We cannot enumerate here all the attempts made to state precisely the essential trouble of schizophrenia. One can arrive only at one conclusion, as much as the ideas of present day psychology offer to define the damage done to the mind by the weakened intellect as much can they offer in what concerns the schizophrenic defect; they only aim at the function, which in value at least, remains intact in the schizophrenics. Expressions such as schizophrenic discordance, or intrapsychic ataxia, certainly gives us an idea of the specific trouble in question. Those ideas, however, remain insufficient until the factor has been determined which, in the normal mind creates concordance, unity and harmony. It is only in that case that they will acquire a real explicit value in the domain of schizophrenia and will permit us to state precisely the fundamental difference that exists between the schizophrenic process and the weakened intellect.

It is exactly that difference which we shall now try to study while keeping in mind what has been said in the first part of this article. At the same time we shall not only content ourselves with proving what is lacking in the patients. We shall also try to show what remains intact in them.

I ask a general paralytic in the period of deterioration: "Where are you?" He answers: "Here." Fearing that that is a purely verbal manifestation on his part I insist, "But where, here?" The patients stamps his foot to indicate the place where he is, or shows

with his index finger or finally, with a gesture, indicates the room he occupies: "Right here," he replies. The fact is not a contingent manifestation, but a reaction, which we find in such patients with striking frequency.

The schizophrenic, in general, if he answers the question asked, he does so, correctly as a rule, while mentioning the place where he is. On the other hand, how many times he states that while realizing where he is, he does not feel himself to be in the place where he is, that he does not feel himself in his body, that the "I exist" has no exact meaning for him.

Factors of two different types intervene in our location in space. The factors of a static type place the objects in relation one to the other, in geometric space, where everything is motionless, relative and revertible. But morever, we live in space and at every moment the active self places before itself the fundamental idea of the "I am here-now" and makes an absolute point of it, a veritable center of the world. In normal life those factors interlace themselves into one another. Our knowledge and our memory images group themselves around the fundamental "I am here-now" and allow us to say according to circumstances, "I am now in Paris, in London, or in my office."

In the general paralytic the knowledge and recollection, in brief, the static factors are at fault.[3]

He is disoriented in space in the clinical sense of the word. The fundamental structure of the "I am here" however, remains intact and active. The schizophrenic, on the other hand, knows where he is but the "I am here" has no longer its normal value and collapses.

At a less advanced stage, we observe in the general paralytic, reactions of a little more complex structure, but the character of which always remains the same. To the question: "Where do you come from?" The patient answers: "From where I was before." He is evidently disoriented in space and is incapable of mentioning the place where he comes from. The dynamic structure, however, of the change of place that is expressed by the relation: X place before, Y place now, remains intact.

The following manifestations belong to the same category of facts:

Q. Where are you?

[3] We leave aside the question whether those elements are irreparably destroyed or whether simply they do not intervene usefully, for reason of functional troubles.

A. Where I dressed this morning or again there where I am since that morning.

Q. What is this institution?

A. It is the institution where I was put.

Q. Who is that gentleman (indicating the attending physician)?

A. It is a gentleman who is here.

Let us now place a general paralytic, who is insane, before a mirror and let us ask him: "Who is it?" He will answer: "I." We continue: "But whom, I?" He therefore states his name and profession. That reaction is much less constant in the schizophrenic at an advanced state of the affection. He answers: "I," and then "my activity," "my personality"; or again, "it is energy," or finally while entering immediately into the sense of an atmosphere of delirious ideas, as in the case of one of our patients, immediately replies: "I know who it is," and emphasizes several times on the "I know" to show very well that she does not experience it any more. "I know who it is," she continues, but it is a simple declaration, there is nothing in it; "it is a funny bobbing," "a fixed glance, oblique and frozen."

The general paralytic thus follows, with the last vestiges of his psychic activity, the road traced by the social self. On the other hand, the schizophrenic does not, and always manifests a greater or less degree of depersonalization.

The pragmatic sense is equally preserved for a certain time in the general paralytic. It suffices to ask him the date, he instinctively takes the journal that happens to be near. The general paralytic, who is completely insane, to the question: "What day is this?" replies: "I have nothing to know by." Another, when we ask him the date of his birth, answers: "I cannot say, I have not my wedding ring." In the wedding ring he would find, not the date of his birth, but that of his marriage, but he no longer differentiates; he knows on the other hand, that there exist means to aid the failing memory, and he instinctively tries to find them.

Altogether different are the actions of the schizophrenic. Very often he knows the date, but that knowledge has no longer any exact meaning to him, he no longer uses it in a manner adequate to prevailing exigencies. What is first affected in him is the pragmatic factor.

Those few comparisons establish the fundamental difference between the extreme states in general paralysis on the one hand, and the schizophrenic process on the other. We could not confuse them.

It is the static factors that are at fault in the first case, while in the second, to the contrary, it is the dynamic factors that have failed.

That formula is evidently too short and schematic. The word "dynamic" is especially confusing. Physics employs it also. But here, as Bergson has so well shown, time is conceived as the straight line and thus assimilated by space. All that is a motion and a progression, all that is real time is immediately excluded from that conception. True dynamics is related to the time lived, and it is altogether another thing. It is the latter that we are speaking of here. We are doing so, however, in an imperfect manner. It could not be otherwise. We are again lacking a sound basis in that field.

To establish this fact it would merely be necessary to state things precisely, grouping all the phenomena of our life relating to real time, and then to observe them in the normal mind as well as in the morbid mind; to create, briefly stated, a psychology and a psychopathology of the time lived. Difficult task if ever there was, but also an indispensable task for whoever wishes to understand the human soul in its normal work and its pathological deviations.

In the meantime, we believe that the manner in which we have recapitulated our observations, translates in an adequate manner the differences we have studied. But this contrast now established between the extreme stages of the general paralytic and the schizophrenic is decidedly more emphatic. It can equally throw a new light on the former phases of the two said disorders and present the essential traits of each one in accordance with the idea adopted at the beginning of this study.

Let us begin with the general paralytic.

As we get further away from the extreme period, the interpretation of facts becomes more difficult. The essential character presented a few moments ago, is found here also.

The fixed time in years, months and weeks briefly, the notion of measurable duration, that is to say assimilated to space, is very often abolished. But that is far from meaning that all ideas relative to time have disappeared. A patient can correctly recall by chronological order, what he has done during the war, but he no longer knows when the war started, nor when it ended. The recollection of the succession of a certain group of facts is preserved, the faculty, however, of relating them to a fixed point, to a determined year, no longer seems to exist.

The duration of space thus disappears. The idea of time being deprived of the boundary of its fixed frame, a contraction of the elements of which it is composed thus easily develops, one might

say. They invade, in their extreme mobility all the mentality of the individual. There is only immediate succession, extreme penetration and rapidity in the confabulatory ideas and delirious statements of the patients. Such expressions as: A little while ago, right away, lately, later, return with a surprising frequency in their sayings. A patient speaks to us every day of her husband, who, according to her, is to come and get her. He is already there, he is coming up the stairs, he will be in the room right away and will take her away immediately afterwards. Or again, there are autos that spin five hundred miles by the hour, or trips to Argentina *can* be made in five minutes. Such dynamics finally invade the whole individual, overwhelm him, and spread throughout the universe. These are the common symptoms of the delirious period of general paralysis. The patient forms ideas for the immediate future. Grandiose ideas, knowing no limitations. He will immediately go to the races at Longchamp, and make a tour of the world. He will also blow up all the islands of the ocean and will go get the moon to put in a glass. He is all powerful, he feels capable of doing all that is done in the world, graft and mate races of animals; he can bring back the dead. In other words he associates all the living beings with that extraordinary development of his strength. He distributes his millions, wants everyone to be happy; he brings all the physicians and all the nurses within his fantastic circle. He will go to Rome to ask for licenses for all the priests and nuns; put all the fishes in freedom.

Everything is movement and nothing but movement, movement that develops with a great rapidity, no obstacle is considered, no distance, no duration measurable. That movement involves all, overwhelms the individual, blots out all the limits that exist between himself and the universe, transforms them into an ambulatory world, into a moving space. The patient translates this state of things into habitual language, with the aid of absurd ideas of grandeur, known to everyone.

Let us now compare in the same way the manner in which a schizophrenic after several years of illness indicates the condition of her mind: "Everything that surrounds me is immobile, she states, and that immobility is in myself. Things present themselves singly, each one by itself, without evoking anything else. Certain things that should form a recollection, evoke a great number of thoughts, produce an isolated picture. They are understood rather than felt. It is the same as a pantomime. Pantomimes that play around me but I do not enter in them, I remain outside. I have my judgment,

but I lack the instinct of life. I no longer succeed in giving my activity a sufficient manner of life. I can no longer pass from tender chords to drawn ones, and still we are not made to live on the same theme. I have lost contact with all kinds of things. The idea of the value of difficult things has disappeared. There is no more current between them and myself, I can no longer abandon myself to them. An absolute fixity surrounds me. I have still less mobility for the future than for the present and the past. There is a sort of routine in me, that does not permit me to face the future. The creative power in me is abolished. I see the future as a repetition of the past."

The above is not, I wish to state, a page of romance. They are statements of a patient, who spends her days in bed in a state of complete inertia, who, when she arises moves as an automaton, who has auditory hallucinations and manifests ideas of body transformation, and who at last taking advantage of a moment's lack of attention, will set her clothing on fire, to gain, as she explains, lively sensations that are entirely lacking in her.

One could not imagine a more different picture from that of the general paralytic described here.

Would that not prove to be the key to the solution of the problem on schizophrenia? The question appearing to be all the more plausible, as the statements of our patient are far from being an isolated and exceptional fact. On the contrary, one needs only to pay attention to find, with a surprising frequency, similar, if not identical, manifestations in the schizophrenics.[4]

It is not necessary to review here all the consequences that permit our point of view, the evidence of which we have tried to show from the psychopathology of schizophrenia. We will content ourselves in giving a few examples, toward which " facts " that point of view directs our researches, and how they permit us to interpret them. We will thus see how the schizophrenic, deprived of the faculty of assimilating all that is motion and time to construct the factors and content of his behavior utilizes faculties, the proper domains of which, in normal life, are solely those of logic and mathematics. At every moment life overflows those boundaries. Any attempt to apply them, in an absolute manner, can only lead to considerable confusion. We now succeed in understanding the origin of the latter.

Let us consider more closely the patient who states he is very

[4] Mme. F. Minkowska, " Des troubles essentiels de la schizophrenie dans leurs rapports avec les donnees de la psychologie et de la biologie moderne." Evolution psychiatrie. Payot. Edit.

fond of reflection, but who imposes it upon himself as a duty, so as not to distort his proper idea, which is to read not at all, and to avoid all contact with his kind. In proceeding thus, it is easy to foresee that he will only arrive at absurd conceptions, such as, for example, to " derive the mind from the action of acids on the nerve terminals," but he is persuaded that he is in the right and has adopted the only attitude propitious to reflection. To us, such an attitude appears profoundly morbid.

Each one of us knows, however, the need of isolation from environment and to have a tete-a-tete with one's self. The phenomenon by itself is not pathological. Why does it appear to us as such in our patient? Because in him it emphasizes the duty of escaping *completely, and in a systematic manner, all strange influences.* That would for us not only be materially impossible, but furthermore, contradictory with the very sense of our need of solitude. For at the bottom we do not try whatsoever to exclude the surrounding world from our intimate life. Such cannot be our desire. On the contrary, we let environment act upon us, but afterwards we again melt the elements that thus come to us from the outside in the crucible of our interior life, to make of them the material of our reflections, and of our personal activity. We wish neither to be blended with, nor to be separated from, our surroundings. We wish to affirm our personality while always remaining in contact with it.

In that case would it not be indicated to put the question: In what measure is it useful, to safeguard one's originality, to permit strange influences to act upon one, or on the other hand to isolate one's self from the world and to thus seek a criterion permitting one to distinguish the normal from the pathological? But we find no valid answer to that question. No mental hygienic precept can solve it. On the other hand, the question itself, formulated thus, seems odd and appears to violate the phenomenon it is aiming at. That is to say, at the bottom the essential element that serves as a regulator in matter hardly allows itself to be intellectualized. It is one of the irrational elements of life. We can designate it as the harmonious sentiment of life. The considered question tolerates no abstract formula. We are capable of solving it, each for himself, on condition that we do not try to agree with logic, but solely to agree with ourselves, to be in harmony with life.

It is exactly that harmonious sentiment of life that is at fault in our patient. Intuitions and the ideas of measure and limit do not function in him.

Thus he takes literally the need of isolation, that which we all

experience at certain times, the need to separate it from all which groups itself around him in life, and gives it its true meaning, makes it rational to the extreme limit, to give it an absolute and abstract form in flagrant contradiction with reality. He really flees permanently from all contact with books and men, "so as not to be disturbed in his thoughts." The richness, the mobility of life disappears. We have in its place an abstract formula that determines an immutable and profoundly morbid attitude of the individual from that fact only.

We were brought to speak of morbid rationalism in this case with Mr. Rogues de Fursac.[5] For the essential problem that we have just pointed out is always found anew in the behavior of our patient. He organizes all his life according to abstract ideas and to purely logical rules. In life he admits no shade, no graduation between wrong and right, between the permitted and the forbidden, between the useful and the noxious, as logic does in relation to affirmation and negation. *Antithesis* guides not only his thought, but also, which is serious, all his activity. In that way, "all his actions, even the most insignificant, pass through the sieve of his principles," he thinks it necessary for spiritual perfection to banish from his own existence *all material work*.

From this moment he no longer considers it possible to attend to his apiary, to which he formerly consecrated, with pleasure, all his leisure moments. That occupation now falls under the rubric "Material Work." When his aged parents speak to him on financial questions, he feels that that is "against his principles" and he does not answer. To consult us is "ordinary suicide," for "man must react by his own will." Words being of silver, and silence golden, he speaks spontaneously and answers questions only after assuring himself that the things to be spoken of are worth the effort according to his principles. Therefore he is silent most of the time. Spiritual work has a positive value, it becomes necessary, and he gives himself up to it *constantly*. Each time, therefore, before partaking of his meals, he makes a plan of the thoughts that are to occupy him during his repast, for "at all times he tries to be master of his thoughts and to register, as an independent man, *all* exterior excitements." He wants thus "to detach himself from the material and to determine his actions in himself by impersonal principles. To gain wisdom is veritable happiness." But instead of gaining wisdom he ends in folly.

[5] J. Rogues de Fursac et E. Minkowski, "Contribution a l'etude de la pensee et de l'attitude autistes (le rationalisme morbide)." Encephale, 1923, No. 4.

That which is logic is absolute truth, is only a profound aberration where the question is to comprehend, to act, and to stay, in harmony with life.

Therefore, how can one conceive the reasoning of the other patient[6] who states that he is not sure of the value of money, because money takes *so little a place*. The patient does not think he can be interested in the fluctuation of exchange, because he finds in it "too much exchange and too much mobility." On the other hand he is completely absorbed by the project of the *extension* of the Eastern station, of which, at the same time the papers speak. He attributes to it a primary importance among all the daily events.

He appears to direct his conduct upon the basis of an erroneous generalization of the idea of space, of a morbid intention, exercised on the mind and conducted by mathematical criteria, determining the value of objects and events solely according to their dimensions or their geometrical characters.

Would we not, therefore, be facing the first signs of *morbid geometrism?*

We learn from the same patient that at the age of sixteen he started to "be obsessed," as he states, on the subject of constructions. He doubts their solidity and asks himself if the walls of the lyceum are straight. "I was tormented," he writes in his biography, "concerning the arches of the churches. I did not admit that they were supported on mouldings and pillars, as on a keystone. All that could have fallen. I neither admitted the cement between stones, because it seemed to me it constituted a frail support for them, which they were crushing. I would say to myself that the houses were upheld only by earthly attraction. And I finally doubted my own sensations."

Then it is the "mania of symmetry" that instills itself. He regulates all his activity accordingly. He will take, by preference, the middle of the street. Treatment prescribed by a physician must not, at any cost, start during the month of November, "because treatment under those conditions would take part of two years, and thus be mutilated."

Obsession on pockets makes its appearance at the same time. He seeks the difference in the impression that one will experience when putting one's hands in straight pockets, from the impression experienced when the hands are in pockets placed on the bias in an overcoat. To solve the problem "he goes by the principle, that in the first case,

[6] Mme. et M. Minkowski, "Troubles du dynamisme mental et phenomenes obsendants." Annales medico-psychologiques(?), 1924, No. 5.

that is, when one has his hands in straight pockets, one establishes a parallel relation between extreme things: the arms and legs."

He also assumes the habit of standing before a mirror, his feet crossed, seeking an absolute symmetry for his body. To obtain "an absolutely perfect position," according to that viewpoint, he would hold his respiration as long as he could.

While in the ward of the hospital, treated with hypodermics of cacodylate of soda, at a certain time, the idea forms in his mind that a piece of absorbent cotton might have penetrated into his body with the prick of the needle. That idea grows in intensity, as time goes on, but in a peculiar manner. Proceeding by contiguity, building, we might say, imaginary cures of an entirely geometrical and rational order, it spreads more and more into space and time. The obsession swells. It is not only absorbent cotton, but a piece of "metal from the needle that I can have in my body; it is a piece of glass from the syringe," and all that goes by the mind to the essential organs, the brain, for example. The cacodylate of soda, built entirely on the element of falsity, and the hypodermics following, beginning with the first one, naturally serve as the basis. The first are jostled topsy-turvy in their turn by the bad one that overcomes all. The whole treatment is worth nothing. It ought to be demolished way down to the root, even to the foundation, and be reconstituted in good condition. On the other hand, a bad treatment must not give good results, for the good results, being constructed on a bad wall constituted by the treatment, will be liable to be swept away in its downfall. And even aside from the risk of the downfall, it is impossible for him to endure the absolutely *illogical* idea of something good resting on something bad, free-stones resting on rag-stones, when it should be contrary.

It is hardly necessary to insist upon the richness of the architectural elements, or the spacious geometric character of all hyperbolical reasoning. Geometrical schemes and logic surpass all. All that constitutes the richness and the mobility of life is irrational, all change, all progression, is entirely excluded in one stroke from the psychic subject.

The patient wants to set a target. Fearing that said target will strike the frame, he replaces it by a larger one. But he notices that the new frame is also higher than the preceding one, but is the same width. "I therefore say to myself," continues he, "that, logically, since it was higher it must also have been wider and I enlarge the ring of the target, although it was not necessary to do so." Hence, new difficulties, new mathematical considerations, and as a final

result, a big hole in the door and in the wall. "I could have filled it in with cement," says our patient, "but *such was not my plan.*"

"Scheme is everything for me," states our patient; "I do not, at any cost, want to disarrange my scheme. I would rather change life than my scheme. It is the liking for symmetry—for regularity—that attracts me towards scheme. Like shows no regularity, no symmetry, and that is why *I invent* reality. It is to the brain that I attribute all my strength."

"What I am going to say will seem formidable, but nevertheless it is so. The actual state of my mind consists in having faith only in theory. I believe in the existence of a thing only after I have demonstrated it. For example, a woman's body produces an impression on man. Why? Here is a thing which I doubt, because I cannot succeed in demonstrating it. I do not intend to be disturbed by that, nor brought into existence without a support and relying solely on my impressions. It would seem to me that I am in the air, which is illogical."

In the street he is sometimes impressed by a woman. Therefore he goes home, sits on a chair, crosses his arms, takes as symmetric a position as possible, and starts to think. He tries to solve the problem why a woman's body produces a particular impression on man. He hopes that all will be solved mathematically, even medicine and sexual impressions. It is in that way that he considers the question. Cannot the body of man be reduced to geometry? Therefore he asks himself if the highest degree of beauty would not consist in the body being in the form of a sphere, a sphere being the most perfect form.

He faces his discharge from the hospital. He becomes perplexed, being entirely incapable of assimilating any change, as his idea of space is solely adapted to durable and motionless things. This is the trend of his thought: "I imagine myself discharged from here. Well, it is absolutely necessary that I should always have the impression of being here and for that I must have something to represent my stay here." Therefore when he leaves the hospital he brings all the empty bottles and boxes used during his stay at the hospital, puts them carefully in order in chests at home, to have proof of having been at the hospital and to have the impression of being still there.

"I seek immobility," he declares; "I look forward to rest and immobility. I also have in me the tendency to render life motionless, therefore I like immovable objects, cases and bolts, things that are always in place, that never change. Marble is motionless; on the other hand, the earth inspires me with no confidence. I attach

importance to solidity only. The train travels on the earth; to me the train does not exist; I only wish to construct the earth."

" The past is the precipice. The future is the mountain. I do not wish to fall off the precipice, neither do I wish to climb the mountain. It is thus that I have conceived the idea of leaving an opening between the past and the future. To-day I am inclined to do nothing at all. It is thus that I once stayed twenty hours without voiding."

" To bring back my impressions of fifteen years ago, to make time repeat itself, to die with the same impressions as those with which one is born, to move in circles so as not to be away from the basis, so as not to be disturbed, that is what I would like."

It would be difficult to find a better example of the methods employed by an ideation entirely spatial, there, where freed from the influence of intuition, so indispensable in life, it tries to direct activity itself.

We have seen the ideal it erects and the monstrous construction it arrives at. Can we imagine a more striking confirmation of Bergson's ideas that were the starting point of our analysis?

We have no doubt neglected in our investigation the clinical state of the patients who have served us as examples. We have neither enumerated all the symptoms nor discussed in detail the differential diagnosis. That would have taken us too far. We have merely wanted to show a few new " facts " in the domain of psychopathology as they are represented by the light projected on the empiric ground by the genial conceptions of one of the greatest of modern " philosophers."

Have we succeeded? It is for the reader to choose.

TRYPARSAMIDE IN THE TREATMENT OF LATE NEUROSYPHILIS.*

By J. Ross Moore, M.D., and Irwin C. Sutton, M.D.

LOS ANGELES

The conception of resistance building in the management of late syphilis is at last receiving the attention that it merits. The fact is becoming more and more appreciated that the arsphenamines, though strongly treponemacidal, are at the same time destroyers of resistance and sometimes even disseminators of foci of treponemata. In early syphilis the aim is to kill all the organisms as soon as possible, that is before they have become immune to medicaments used. In late syphilis, on the other hand, where it is manifestly impossible to absolutely sterilize the individual, it is of the greatest importance to build resistance. There has been a great need for different modes of attack on stubborn infections and those in which it is of more importance to heal the lesions than it is to kill organisms. Our greatest problem has been to successfully combat infections of important tissues comparatively inaccessable to arsphenamine when given intravenously. The neuraxis is such a tissue. Wile has voiced the experiences of many when he cautions against the intensive treatment of late paresis. It should be remembered that "persistence in the use of drugs which did not in the early stages bring about radical cure will not often be rewarded by cure in the later stages of syphilis." Stokes and Schaffer have shown that the long continued use of combined intravenous and intraspinal therapy may bring about remarkable improvement in clinical and serologic findings. In a series of 405 patients they obtained practical results as follows:

91 per cent of meningeal neurosyphilis.

74 per cent of cerebrospinal syphilis.

48 per cent in tabes.

38 per cent in vascular neurosyphilis.

These results were obtained by experts with every facility

* Read before the Section on Neuropsychiatry at the fifty-fourth annual session of the California Medical Association, May 18, 1925.

for good and careful work at their disposal and could never be duplicated by the ordinary therapist.

It is remarkable achievement at this time when case reports dwell extensively on the laboratory reports and slur over the actual condition of the patient, that a drug which admittedly does not have more than a weak treponemacidal action and which rarely changes the Wassermann reaction of the blood or spinal fluid, can by sheer force in producing clinical results achieve prominence in the treatment of syphilis of the central nervous system. Tryparsamide, because of its remarkable penetrability does reach the nervous tissue, and when it reaches the lesions in the neuraxis produces resolution and healing. Although it does kill trypanasomes it does not seem to have much direct effect on the organisms of syphilis. It seems rather to act indirectly either by stimulating animal economy or by building resistance in the host toward the treponemata. Our whole conception of the aims to be accomplished by the treatment of syphilis will probably have to be recast. Our whole plan of attack will include both attempted sterilization in the early case with effort, in the late case, to heal active lesions and build resistance. Broadly speaking, the treatment of late syphilis should be symptomatic instead of attempted radical cure.

Tryparsamide, which was first made by Jacobs and Heidelberg, is the sodium salt of N-phenyl-glyceneamide-p-arsonic acid. It is very stable in solution and does not undergo decomposition on exposure to air. It is a white powder containing about 22 per cent arsenic. It is soluble in an equivalent amount of water, that is one gram will dissolve in one c.c. of water, but a more dilute solution is advised for intravenous injections. It is usually administered in a 33 per cent solution, one gram in three cubic centimeters of freshly distilled sterile water. The resulting mixture is easily filtered before administration by drawing it through a pledget of sterile cotton into an ordinary glass syringe. It should be clear, but is often milky or slightly opalescent due to small amounts of calcium in the water or on the glassware. There is practically no danger attached to the injection of the cloudy solution. The injections are given into the veins of the forearm in ascending doses of from one to three grams at intervals of one week for eight to ten times, when a vacation of one or two months may be allowed. Since tryparsamide is so weakly treponemacidal, Lorenz and Loevenheart gave mercury

salicylate in conjunction with the hope that the clinical results would be more lasting. Since mercury is also but weakly treponemacidal it would seem more logical to combine tryparsamide with either bismuth or to alternate its injection with arsphenamine or sulpharsphenamine. This latter procedure is open to the very serious objection of overdosing a patient with arsenicals. Bismuth, both because of its demonstrated potency and because it is a new drug to which the treponemata would be expected to have no immunity, would seem the ideal running mate for tryparsamide. Although bismuth is rather toxic and causes some loss of weight, when given with the arsenical the benefit should far outweigh the disadvantages.

In our experience immediate reactions from tryparsamide are very rare. Only twice has the faintest nausea occurred and then only because the injections were made too rapidly. Nitritoid reactions are practically unknown. Jaundice and purpura have been reported as unusual occurrences and evidently happen far less often than with the arsphenamines. Of greater practical importance is the tendency toward excitement and abnormal sexual stimulation which Stokes and Wilhelm have pointed out may take place during the first course of treatment, especially in paretics who are already excitable and maniacal. Suicidal tendencies are not uncommon. For some reason these reactions are especially seen in those patients who have received only small doses of the drug.

Of the greatest importance are the reactions affecting the optic nerve. Here again small doses of the drug, by acting as a stimulator or intensifier of sub-active optic nerve lesions may cause serious difficulty. Large doses or doses given at too frequent intervals, may cause some haziness or dimness of vision and if the drug is not stopped may result in permanent optic atrophy. Since the damage is central and not peripheral, fundus findings are of little worth. We must depend on changes in the peripheral fields and on the objective symptoms of blurring, spots before the eyes and light flashes, for evidence of irritation or nerve damage. Treatment should be stopped for several weeks after the signs have disappeared, for irreparable harm may be done if the injections are continued. Lillie, of the Mayo Clinic, in a selected series of cases, has shown that tryparsamide, when rightly used, was not more harmful to the eyes than the arsphenamines in the treatment of nervous system syphilis. The following

case of reversal of spinal fluid findings is worthy of mention, for this is the exception which calls attention to the rule that serologic reversals are very rare with tryparsamide treatment:

Case I. A man, aged forty-three, with symptoms of early paresis was put under treatment with bismuth and tryparsamide in August, 1924. He had previously received intensive treatment with arsphenamine and mercury to saturation. His memory and attention were poor and he had a slurring speech. His spinal fluid examination showed a high cell count, a strongly positive Wassermann reaction with increased globulin. He received twenty injections of tryparsamide and forty-five of bismuth tartrobismuthate. In January, 1925, the fluid findings were as follows:

Blood—Wassermann	neg.
Wassermann, spinal fluid	neg.
Cell count	10
Globulin	1 plus

He was rather irritable under treatment and quarrelsome, but gained weight and seemed much brighter. Between the courses of treatment he seemed fairly normal mentally, but complained of feeling dull and stupid. Three months after his last course of treatment he began again to show difficulty of speech and to be flighty and irritable. He is now under treatment again.

Case II. This patient was an elderly man who had been under treatment for some time for central nervous system syphilis. He was mentally deteriorated with a marked change in personality and lived the life of a recluse. He received one course of treatment with tryparsamide (a total of 27 gm.) and 1.5 gm. of bismuth salicylate. He seemed fairly bright and somewhat stimulated from the treatment, but aside from a slight increase in sexual desire he was practically unchanged. This was probably a case of non-syphilitic psychoses occurring in a syphilitic patient and would not, therefore, respond to specific treatment.

Case III. This patient was put in a sanitorium because of his maniacal state of paresis. While there he received intensive treatment with arsphenamine and mercury following a careful preparation with iodid and mercurial inunctions. He seemed much improved and was given a course of bismuth and tryparsamide injections one month after cessation of other treatment. His spinal fluid findings were practically unchanged by treatment, although he put on weight and felt better. His speech defect was unchanged.

Case IV. A man, aged fifty-seven years, complained of *petit mal* attacks. His pupils were rigid and his knee jerks were absent. His serologic findings were:

Spinal fluid Wassermann	Weakly positive
Cell count	19
Globulin	Increased
Gold sol	Negative
Blood—Wassermann	Positive

His cells dropped to four and the globulin test became negative after tryparsamide injections, but the spinal fluid was otherwise unchanged. He put on weight and was comparatively free from attacks.

Case V. Cerebral syphilis. A man, aged thirty-eight, complained of feeling nervous and apprehensive. He had been treated for neurasthenia for some time before it was found that his blood and spinal fluid showed signs of syphilis. His treatment for syphilis was haphazard and lapsing over two years; his symptoms gradually becoming worse. His serologic findings were:

Blood—Wassermann	4 plus
Spinal fluid Wassermann	4 plus
Globulin	Increased
Cells	94
Gold sol	1123344210

After ten injections of tryparsamide and twenty-four of bismuth formitate his findings were:

Blood—Wassermann	3 plus
Spinal fluid Wassermann	2 plus
Globulin	neg.
Cells	8
Gold sol	0012210000

He was markedly improved clinically and has returned to his occupation as bank clerk. Whether he will continue to improve under further treatment remains to be seen.

A careful examination by a competent ophthalmologist of the vision, fundi, and perimetric fields should be made at the beginning and end of each course of tryparsamide injections so that changes especially in the perimetric fields can be detected. The rough "finger test" for limitation of visual fields should be made before each injection and the patient questioned for signs of visual disturbance. Unlike atoxyl, Moore and Woods have shown that stopping the drug when symptoms first appear causes a prompt subsidence of irritation to the nerve without any serious impairment of vision.

Tryparsamide has demonstrated its potency by repeatedly improving cases of paresis where the other drugs had failed. The improvement, while mostly clinical, is also manifest in the spinal fluid findings. The globulin, cell count, and colloidal benzoin or gold sol curves are commonly affected, but the Wassermann reaction is less often changed. The blood-Wassermann may be even rendered more strongly positive in cases with a negative serology ("burnt-out" tabes), where we are dealing with scars or degenerative lesions. Clinically, however, trypar-

samide produces occasionally brilliant results. The response of cases with gastric crises and lightning pains is sometimes astonishing. Patients almost as a rule put on weight, become more cheerful and feel powerfully stimulated.

The ease of administration rivals that of neoarsphenamine, and because of its freedom from acute reactions may easily be given in the office. Its use does not entail the inconvenience, loss of time, pain and worry that intraspinal procedures carry.

Summary

The fact that tryparsamide carries a menace to the optic nerve should never be forgotten, and it is well that the responsibility should be divided between the patient, the patient's family, and the physician.

In selection of patients for this drug, it is our impression that those who have received prolonged and intensive saturation with mercury and the arsphenamines show more striking gains than those who have received no preparatory treatment. The previously treated case is also less subject to the Herxheimer-like flare-ups so often seen during the first course of tryparsamide injections.

It cannot be too strongly emphasized that tryparsamide is primarily a resistance builder and a healer of lesions, but not a treponemacide. This fact precludes its use in early syphilis. Its greatest worth is in paresis and late tabes dorsalis, and selected cases of central nervous system syphilis which have resisted systematic and combined intravenous and intraspinal therapy with the arsphenamines.

A FURTHER CONTRIBUTION TO THE PSYCHOLOGY OF THE ESSENTIAL EPILEPTIC.

By L. Pierce Clark, M.D.

NEW YORK CITY

In previous studies I have attempted to show that in the majority of all cases of essential epilepsy the invariable character or epileptic makeup is a true stigma of the disease. That is, it is not produced by the occurrence of fits although often markedly accentuated by the severity and frequency of the latter, and the mental stigma although differing in degree is invariably to be found existent from birth. From an objective viewpoint one can easily show that the main or salient characteristics of this mental state are egocentricity, supersensitiveness, and emotional poverty; in short, there is present a singularly pure type of narcism. Is this narcism but a concomitant of the unique psychology of the essential epileptic, quite unrelated to his frank disorder as such, or is it part and parcel of his total defect? If the latter be true, how does this essential mental stigma come about and is it a dynamic factor in the later induction of the frank disorder? Let us assume this latter statement to be true. What do we find in examining this rather unique psychopathological factor? We know the essential epileptic is infantile emotionally but is much less frequently so in the intellectual field. His general defects as a social being and his self-centered attitudes are too well known. The different points of fixation and the varying amount of primary narcism entail varying degrees of narcistic defect. It ranges all the way from the crudest pattern of mother-identification, to a repressed homosexuality as shown in the not infrequent asexual epileptic. The latter is the simplest and crudest pattern of the ego libido. It is proverbial as well as clinically known that object libido is greatly attenuated or almost entirely absent in all epileptics, and it is the decided overbalancing of the ego libido trend that entails the continued mishaps of their disease.

Although it is not the object of this brief contribution to present detailed clinical records of case analysis and the consequent therapy of such procedure, we may briefly indicate the general principles of the difficulty and how it may be overcome. Nothing less than a complete analysis of the narcistic state will permanently relieve these

epileptics. In the beginning dream analysis strictly and solely as such has not yielded desirable results. There must be a specific reawakening of the infantile unconscious. How is this possible in so pure a form of narcism as that exhibited in the essential epileptic? This must be carried out by a narcistic transference. Inasmuch as the usual point of greatest fixation is in the narcism we must build up mother libido as the transference leverage. To the average epileptic the whole external world is invested with pain or irritation, hence he builds a proportionate wall of narcism, an unreal world but to him it is a defense mechanism against the objectification of his libido which so jealously guards his very existence. His loss of consciousness is a violent effort to break down this barrier and recover the former rapport with the universe which he experienced in the organic relationships with reality. The fit is therefore a repetitive compulsion of the death impulse. Hence we find the well known flexibility and lessened pain of reality which he gains in the deepest regression in the fit, and for a brief time after. Thus every seizure is a pathologic attempt to repair this primary insult of the withdrawal of reality and its inherent enmity. Our efforts therefore must be along the lines of the regressive recovery of the totality of this original trauma of birth and weaning. We can hope for success by repeatedly surveying and clearing this pathway, allowing the primary narcism to be acceptably repressed or sublimated directly as such, or by building up object libido and thereby reducing the dynamic drive of the libido energy that passes over to the service of the ego libido. How we may build up sufficient mother libido for a transference leverage in the epileptic is our greatest task. This is also true in dealing with all the other ego-neuroses, of which essential epilepsy may be justly considered the *grand* type.

Much of my case material is drawn from the classic epileptic, the phantasy method* of analysis being used to induce an insight on the part of the patient and allow him to sublimate so much of his narcism as is necessary for his well being. I make no contention that the phantasied material is a facsimile of actual memories of infantile experience. To do so would naturally stultify our conception of the inexperience and inaccurate formation of mental images in infancy. But I do not maintain that these phantasies throw a flood of light upon the *affective attitudes* during these infantile reactions to adapting to the mother-and-child relationship and the integration of character and personality consequent thereto. The phantasies are therefore

* "The Phantasy Method of Analyzing Narcistic Neuroses," N. Y. Medical Journal, Feb. 3, 1926.

psychologically true and are worthy of continued investigation and use in the analysis of narcistic neuroses. This is the first successful attempt to analyze the essential epileptic so far as I am aware in the history of this disorder. The actual results upon the recurrence of fits so far is most striking in the cases which I shall cite briefly. One case, epileptic for nearly twenty years, has had no complete grand mal attacks for over a year; some half dozen petit mal occur monthly at the present time, but when one considers the fact that this patient had serial and status of 200 and 300 attacks every month for years, the clinical results so far as seizures are concerned are very noteworthy. Another case with weekly attacks has passed several months without any, while a third is free from attacks for months and formerly had weekly seizures. Another epileptic has had but two attacks in the past year, whereas they occurred regularly every ten days formerly.

The following verbatim account recounted by a hypochondriacal epileptic of a severe and chronic type is given, first, to show the so-called objective phantasial recall shot through here and there with vivid emotional instances of subjective identification with the infantile life. This young man has been under the phantasial recall method but a few weeks. The first part is still from childhood memory and only in the latter part do we see the picture of an infant actually nursing, especially noted in the second session. Again, the indication of painful transition or weaning from the diaper is shown in that he is again "torn away from the close side of living," et cetera. The anal erotism of this patient was very marked. Note also the patient's comment of the beneficial effects of this form of analysis is cloaked in the terms of the mother identification period similar to the state of bliss in the nursing act itself. While the primary narcism greatly responsible for the incitation of the hypochondria, the successive induction of anxiety, the successive protections of the ego remnant, a continued parting from the child's outer world reinvoke renewed accessions of hypochondria. In the later analysis we shall see the analogic facsimile of his adult hypochondria as shown in his agitated sadness and desire for that something lost for him, this bliss of the outer world as personfied in the maternal attachment.

Example 1. H. W. "The nursing period is like a big, bright light in mother's arms—no one can hurt the child—great relief just resting there—sure to get perfect rest against this human cushion—(seems pleased and happy). The mother's eyes always rest so softly and kindly upon the child. While she nurses the child I think it is

the most perfect time in life—with the mother protecting it against all harm. Have a sense of feeling that the baby is being rocked (low tone). Everything given to the child without asking for it in words—the bottle, and small crackers perhaps—it was the look in its eyes that spoke to them—and they took care of its wants so carefully. Someone is always watching the child, the governess, the mother, and later in the day the father. Oh, how I wish I were back there—those nursery days—the bright room—sunshine—everyone entered with a smile. (Voice changes to more emotional affect.) Sunshine—health—happiness—all working together. Felt big when I was allowed to sit in a high chair, the grandest part of my life. A bright day—I am playing on the floor—father and mother read and talk not noticing me—I am happy because they are there. The bed is so large—I seem so small when they put me in the middle of it. When I was taught to use the toilet I had a feeling that I was not living so close to my parents as formerly—I was torn away from the close side of living—shock of being torn from something you were fastened to so completely—so sad—I did not think anything was the same—not so much at ease—everything seemed stricter—before I did not have to take the trouble to go to the toilet—everything done for me. My diaper was given such attention—perfect satisfaction. Used to be attracted by the contrast of the diaper and the stool—odor and color. I would have it proved to me that it was awful by expression on mother's face, or the governess'—they would turn their heads away when changing, it was so awful (signs of disgust). Then they would say, try to be good and not do it in the pad. Found the toilet more difficult to use than the diaper—holding me on, or someone standing next to me—and so dissatisfied to be taken up. I would always notice the expression of their eyes—it gave me a hurt feeling even before words were spoken, before I was able to walk alone. Mother always kissed me a lot—I started in to like kissing. I was set against taking the bottle at first—I was envious when I heard my parents say how easily my brother took it. It took me some time to become accustomed to it. Mother would say, "Good boy." Whenever she said this it made me feel contented—but I didn't like the black rubber nipple—I never liked anything black. I felt more contented when the color of the nipple was changed to red. It was difficult to take the bottle—the happiest time I ever had in my life was with my head resting on mother's breast and her arms around me—just thinking of father as "man"—it was very hard at first to pay the slightest attention to him. Mother

gave me the bottle even after I came to the table in my high chair and was having cereal—a small piece of bread and butter—I still demanded the bottle—the affection of my mother reminded me of the bottle—it would give me a great deal of pleasure to have her feed me.

" When my younger brother came I felt slighted (three years old). I looked with a disinterested air. My parents would say, " He's your little brother, you must be nice to him "—I never knew what it was they thought I had to do to show him that I loved him—I didn't think of him in a loving way. I used to like to kiss father and it struck me hard when father said not to kiss him any more—I liked to be fondled by all my relatives—it was said I acted too effeminate —father would say, " Be a man "—I used to hug father instead, and later he stopped even that. Envy, jealousy, anger were all easily awaked. When a little boy I remember the great impression that it made on me to hear my parents say I was a very delicate and pale little boy——

" I think of this form of analysis as the opening of a big secret —I am finding out about the darker part of me. I feel that we are reaching some very important points, but how I cannot say—I am loosening up mentally—my thoughts have changed immensely—greatest happiness—mental ease—everything is going along the finest way—feel so much more satisfied with life with less effort.

Session 2. " A little child is in a room filled with sunshine—in bed with his mother or else in his own crib. This child is nursing —milk is warm and refreshing. Washed by his mother—putting his hands in the water—playing with the soap suds—watching the suds vanish away—such a satisfaction in perfect cleanliness. It has a great desire to have some more of the milk—resting its head on the mother's breast—a human cushion. The baby turns its head to the left. The mother sleeps on her left side. Things are so comfortable for the baby that it does not have to turn its head an inch. The baby is filled with happiness, joy and contentment, feeling his mother's arm around him—comfortable position, just lifting its eyes and seeing its mother's eyes looking directly at him—fascinated by her smile—a large smile—and kissing the child—a feeling arises in the child—it's belonging to the mother—a part of her—so many of those pleasant glances and looks—what happiness for the child. A feeling from the time it was born as being a part of its mother always—her arms around the child—nursing at her breast—drinking milk—it cannot be anything else but the greatest happiness for the

child—caressed and fondled—so perfect. It sees in the mother's eyes a happiness, while nursing—the mother's eyes, her hair—it sees mother's eyes and forehead and mother's mouth—especially that smile. It must mean that mother is happy and as mother is alone with the child, the child must feel that he is the cause of this happiness to mother. The child is being easily satisfied—the mother is contented. A little soft mouth and mother's big soft breast—draining the milk from her breast—her arm—her glances—her smiles. The child tries to return them. Both so relaxed—peace of mind. It must be a pleasure to the mother—give the mother a great feeling of satisfaction—she was the one who brought this child into the world. The mother must get pleasure—the child is so gentle—nursing is so fine it must go on all their lives. A deep, inexplicable look, and you can look so much deeper into mother's eyes than anyone's else. Others could not see as far and with the contentment that the child can do. A deep, unfathomable look—radiant. She puts it into the child's mouth—spreading through the child's entire body from head to feet—the eyes—mother's eyes—the large, deep soft eyes filling me with joy. The child feels that it is surely part of the mother. If the mother just turns her head away from the child for a moment and then turns back to it again, it is like an extra thrill—joy coming with just as much pleasure as if the child was being nursed for the first time."

It may be interesting to note that this patient displayed more concern about his mother after this analysis than at any other time. His main conscious concern is directed toward the father. At a recent interview this patient said: "I feel a great change has taken place within me. I can see that all my life I have been overdemanding and overexact. For instance, the way I keep my personal belongings; everything has got to be just so. I used to feel that my parents made me this way and that later on in military school it was increased by the rules and regulations there. But now I am beginning to see that there is something within me that has always called for just such feelings and demands. I know I must be boresome at times. I can see that I am very childish in many ways, such as the way I dance, do tricks to gain attention, and make up little rhymes. The people here must think I am kind of childish and I want to get away from doing these things and learn how to be more of a man and act like other people. I am able at times now to go out with the others and do not seem to be so much disturbed if I get a spot on my clothes or my hands are dirty. The time passes quickly while

I am working and I don't seem to mind what kind of work I do at all. Whereas I can look back and see that I used to demand that the work be just so before I would have anything to do with it."

The above was said with what appeared to be genuine sincerity coupled with an insight that the difficulty lay innately within himself rather than with his environment. In contrast to the above, when the approaching symptoms of hypochondria appear, the patient loses this insight proportionate to the degree of his hypochondria. At first he will say that his trouble is now coming out in a different way, that it is like a bottle that has gradually been filled up and must spill over and the spilling over is the symptoms. This phase carries a partial insight, which later is entirely wiped out and the picture becomes so clouded that he places the blame upon his environment, and he demands some sort of physical assistance, preferably something taken internally. He reiterates his symptoms, finds fault with his companions, becomes demanding, until finally an explosion in the form of a mild attack appears. This immediately reduces the demanding attitude but in an hour or so the hypochondriacal symptoms increase with force until the demand is once more brought into consciousness and another seizure occurs. Following several mild seizures the patient begins slowly to reconstruct himself once more and finally reaches the stage where he is able to take up his analytical work and put into practice the insight described.

The next instance is that of a narcist manifested in a dictatorial and overbearing personality of a middle-aged man, whose idiopathic epileptic attacks first appeared at the age of seventeen. Both at work and play he shows quickly changing moods; he resents any real or imagined lack of consideration towards himself. The most trifling incident, provided it is one in which he feels slighted or ill-used, is sufficient to send him out of the room in a rage. In these moods he loses all self-control and gives vent to his feelings sometimes in abusive language. On the other hand, when content with himself and his environment he is cheerful and likable.

Example 2. A. D. (This content of the nursing period is given in a low monotonous tone, indicating a state of satisfaction.) "Mother takes baby in her arms—baby seems to like that somehow—mother seems to hold it nicely—it's nice and soft in her arms—mother thought a lot of it—seems to be against the breast—likes it pretty well, contented—likes the feel of flesh—satisfied—seems to go to sleep, and is put down by mother—wakes up after a few

hours—seems contented—then gets lonesome—(patient frowns deeply, presses his thumb and index finger against his closed eyes, his tone becomes mildly annoyed and his movements are restless)—wants someone with it—begins to cry—no one comes—gets mad—hollers—kicks—screams—and then mother comes and picks it up and it is all right again.

"The baby didn't like the bottle—they had quite a time putting the nipple in his mouth—seemed hard—didn't like the feel of it—gets awfully mad—fights—wants his own way again—but they don't seem to give it to him this time—they don't seem mad at him—they don't spank him, but still they seem to think he ought to take this bottle. Baby looks at the mother a lot—he seems to get the idea that the mother knows what she's doing, and that it is right for him to take it—and he tries a little of it—it doesn't taste so bad—but it hasn't the same feeling as the skin had when he was nursing—he's still mad, and he doesn't take much of it—I guess he took it because he seemed to think his mother thought it was good for him. Seems as if this baby is a pet—seems to want to be in mother's arms all the time. I always get a picture of this baby being boisterous and mad—mother picks him up and he is all right—he seems to want his way—he shows off when company is about—I can see him now dancing up and down in front of the company one minute, and the next minute he's mad—I guess it's because they don't notice him enough. This baby seems to always want his own way. I can see it now. It's in a carriage. The mother is pushing the carriage back and forth, and the baby likes it and goes to sleep—(contented and happy emotional affect). After awhile he wakes up. He thinks somebody ought to pick him up right away. (Tone of voice changes at once to louder, annoyed tones.) But nobody does. He seems to think that people ought to know what he wants and do it for him. He gets mad because they don't come at once. Then he cries and hollers and by that time mother goes over and picks him up—he quiets down, seems to be all right for a few minutes—now he has an idea he wants to get on the floor—nobody seems to let him down—and he has to holler again and squirm a little bit—and now they let him on the floor—once he seems to be all right—now he is looking over in the corner—he thinks he sees something—he starts to crawl over—something is tugging at his back, holding him—he hollers again—finally they let him go, and he crawls along until he gets to the place—he looks at the spots on the floor and seems contented when all of a sudden he seems to think he ought to be picked

up—they don't seem to understand what he wants—and he seems to feel that they should know what he wants—that's funny because he doesn't tell them—(understanding seems to creep in here)—and he can't tell them, but he is mad just the same because they don't know and he hollers until they do pick him up—and then he is all right again for awhile. That's the way it always seems with this baby—he always wants his own way. He has a very bad temper, and if he can't get his way he gets mad. He always thinks someone should be doing something for him." At this point the analysis ended. The patient sat up and had a dazed expression. He kept pressing his thumb and forefinger against his closed eyelids. In low monotonous tones somewhat fearful he said: "I can see that I'm that baby. That's the way I've been all my life, always wanting my own way and fighting when I couldn't get it, always demanding that people think of me and give me attention and being unhappy and disturbed because I didn't get it. Now here's a good example: I sit all alone out on the lawn while the others are dancing in the gym. I feel mad inside, I think they ought to come out and invite me in. They don't do it and then I feel that they don't like me, they don't want me, and I get made inside, just like that little baby. But why should they invite me? If I want to go in why don't I go? It is up to me. I can see that very plainly now. Another instance is the way I used to act towards my brother. I used to think because he was in the firm that he should make things easy for me and I would find fault because I could not be advanced and given more money and treated as I thought I ought to be treated and of course I never got it that way so when I found fault with my brother, complained to my mother about him and would get all upset and blame him for the very things that I myself used to do. Now I can see that that's all wrong and I feel that when I get out into the world again I am going to be able to look at things in a different light, more grown up."

A letter from this patient after he had spent part of the summer looking after a number of boys at a summer camp states that he is happy and contented and has not lost his temper once. He has a feeling of confidence that he is getting better and inquires cheerfully about all his former companions and hopes that they are gaining the insight the analysis gave him.

Now that we have succeeded in penetrating the infantile unconscious of the essential epileptic, at least in a phantasial reproduction of this period, and find it is not dissimilar to the postulated formula-

tions as outlined by Freud for the pregenital sexuality of the infant, and also that the oral and anal erotism as presented by Abraham, Jones, Ferenczi and Stärcke are in close accord with our work, we are forced to reformulate our conception of the real nature of the epileptic. Heretofore by objective study we were able to go no further than the reaction formation of the peculiar narcistic pattern of the epileptic. This is his outer clinical pathognomonic makeup called the epileptic constitution. But we now see that this makeup as such is not final. At heart the epileptic is the most tragic and pitiable of all oral and anal erotics. The lamentations of his infantile concern at the birth and weaning trauma proclaim him so weak and sensitive that his defense reaction in a stupendous narcism is the invariable consequence. Our therapeutic concern is neither to remove his narcism as such nor to reshape it into a more acceptable pattern, as is so popularly followed by empiricists in this field to-day. On the contrary we must steadily cathectate the wounded infantile soul from its traumatic fixation at the birth and nursing period so that his narcistic protection may be automatically reduced and thus permit a more equable rebalancing of the ego and object libido in healthful living. The hopefulness as well as the tediousness of the task may be fully attested to by myself and my several assistants who have been working upon it for some time.

As I have already outlined in previous studies,* we know objectively that precedent to the fit in many cases there is a narrowing of the field of objectivity and an intensifying of subjectivity or self-amnesis, and finally this latter state is seemingly drawn in or rather met by an uprush from the unconscious of ideas and emotions and the activation of all sorts of muscular movements are then precipitated. There are different degrees of regression or disorders of consciousness at different depths or levels. The types of ideas encountered as well as the types of muscular movements in the fit are correlated to the depth of regression until in the classic grand mal fit we have the archaic data of mental content of the life at or before birth as well as the crudest patterns of impulsive movements that are so soon superseded by the different integrating levels of the reflex, instinctive and ideational type. Thus we may tentatively account for both the peculiar type of loss of consciousness and the convulsion in the clinical picture of the fit.

* "Remarks Upon Consciousness in the Epileptic Fit," Boston Med. and Surg. Jour., Oct. 27, 1921; "A Study of Certain Aspects of Epilepsy Compared with the Emotional Life and Impulsive Movements of the Infant," Interstate Medical Jour., Oct., 1915.

As a tentative formulation we may state that the essential epileptic is intrinsically a specific pattern of oral and anal erotic in whom the clinical phase presented by him is the reaction formation of narcism known as the epileptic makeup; that the excess formation of the latter produces a rigidity and inelasticity of the personality incompatible with flexible living. Hence the explosive fit, the latter being a necessary corollary to the state as a whole.

2 East 65th Street.

ON THE CLASSIFICATION OF THE PSYCHOSES

By Leland B. Alford, M.D.

ST. LOUIS, MO.

Classification still is, as it has always been, among the major problems of psychiatry. In the first place there was great difficulty in setting up groups, and while Kraepelin's formulations have won general acceptance many psychiatrists still regard them as tentative and to be retained for purposes of convenience only. Furthermore they are without etiological significance. Again, since Kraepelin's classification has been accepted great difficulty has been experienced in placing many individual cases. Perhaps a half of all cases are sufficiently atypical to permit of a difference of opinion as to what label should be attached to them. Not only do individual psychiatrists closely associated hold various views in this respect, but divergent standards are followed by different institutions and psychiatric centers. The standards of any one psychiatrist or institution also vary from time to time. Dr. Southard used facetiously to ask of his staff at the Boston Psychopathic Hospital whether manic-depressive or dementia precox was the fashion of the moment.

Such a state of confusion is clearly in need of correction, and any attempt to bring order to the chaos is to be welcomed. Obviously the problem of classification is directly connected with that of causation. The etiology of mental disorder must be understood before classification can have a substantial basis.

The Etiology of Mental Disease

The pathological process underlying mental disturbance is still obscure. Conventional methods of approach, such as the microscopical examination of tissue, clinical observation, chemical examination of various sorts, and psychological research, have been pretty well exhausted without yielding definite conclusions. One may therefore be pardoned for reverting to the realms of speculation and by the method of logic determining what the probabilities seem to be. It is surprising that before now investigators have failed to see how much may be learned in regard to mental disease by considering the known facts of analogous conditions that are more accessible to study.(1)

The nervous diseases that afford the closest analogies to the

psychoses are not difficult to discover once chief characteristics of the latter are set down. The main facts of the psychoses are (1) the influence of heredity, (2) postnatal onset, and (3) chronic and progressive course. The nervous diseases to which these facts also apply are clearly the abiotrophies or heredofamilial degenerations. There are many of them; a few are the muscular dystrophies and atrophies and Huntington's chorea. The pathological process is essentially the same in all, and consists of a degeneration of nervous structures depending entirely on innate weakness, although it may begin at any time of life. Changes in structure may or may not be evident under the microscope. The symptoms of the different abiotrophies depend upon the particular nervous structures that happen to be affected in the process in each instance.

Huntington's chorea is the most instructive example for our purpose. It consists of two components, the motor symptom of chorea and the psychic disturbance which is well known. Although not microscopically evident, the " organic " nature of Huntington's chorea cannot be doubted in the face of the motor symptoms. The mental symptoms must, therefore, also have their origin in structural change. Now these mental symptoms are of the same order (*i.e.,* arise despite retention of the faculties such as memory, perception, etc.) as those occurring in the psychoses. Take away the motor part of the symptomatology of Huntington's chorea and one has a psychosis entirely analogous to dementia precox. *It is a plausible conclusion, therefore, that the psychoses have their origin in an abiotic degeneration of certain nervous structures.*

Method of Grouping of Abiotrophies

Having reached the conclusion that the psychoses are abiotrophies, the classification of the former may be studied by considering how others of the abiotrophies are divided. Here also a certain amount of confusion obtains, but some salient facts are fairly definite. For instance, there are major groups that apparently are altogether distinct and unrelated to one another, but within these groups are disease types of the same essential nature that have different symptoms but are linked together by intermediate forms. For example, take the following major groups:

(1) The hereditary ataxias. Friedreich's and Marie's types are ordinarily given, but some writers add others. These types, it is generally understood, are not clearly separated but are united by all sorts of intermediate clinical pictures partaking of features of both.

Spiller (2) states: "In fact no dividing line can be drawn between the two types either clinically or pathologically."

(2) The muscular atrophies, of which some types are Aran-Duchenne, amyotrophic lateral sclerosis, bulbar palsy. Collier (3) groups them together as one condition and says that ". . . it must be borne in mind that every transition between these types may be met with."

(3) The muscular dystrophies, including the types, pseudohypertrophic, Erb's and facio-scapulo-humeral. Barnes (4) writes: "It is now clearly recognized that these three types are essentially one disease. . . ."

(4) The congenital diplegias. Many of these are due to some accident connected with birth, but it can scarcely be doubted that many are due to an aplasia.(5) Some types are paraplegia; bilateral athetosis; athetosis in arms and face with paraplegia of legs; flaccid.(6) Yet they are undoubtedly one condition and intermediate forms unite the different pictures.

Interrelation of the Psychoses

There is reason to believe that Kraepelin's groups of the psychoses are not unrelated to each other. In the first place there is the difficulty already mentioned in labelling many cases, no matter how strict our attempts to follow the criteria laid down. Cases constantly are found showing features of more than one psychosis. Most common is a confusion between manic-depressive and dementia precox, as is well known to all psychiatrists. Of those arising in the involutional period besides the mixed type (agitated depression), cases are found resembling the other psychoses, and individual cases vary at different times, now appearing typically mixed and again resembling dementia precox or manic-depressive. The same is true of conditions arising in the senile age. In fact, totally different standards are usually employed in reaching a diagnosis in the earlier and later age periods; the earlier cases (manic-depressive and dementia precox) being judged by the symptoms they present and the later ones on the basis of age of onset. For instance, involutional melancholia is apt to be applied to all cases arising in the involutional period regardless of symptoms and senile psychosis to the later developing cases. Finally may be mentioned the mild borderland cases, which may be designated simple depression or even psychoneurosis. One would conclude, therefore, that where dividing lines are so indefinite a fundamental distinction may not exist.

A second type of evidence indicating kinship between the psychoses is furnished by family histories. Constantly the offspring of the supposed manic-depressive patient show an unmistakable picture of dementia precox, although the reverse relation is said rarely to occur. A similar interrelation is seen between the involutional or senile groups and the earlier arising forms. These are facts that have been noted by most investigators into heredity, and they are indicative of a relationship that is fundamental.

Here there is a situation similar to what was pointed out above with regard to other groups of abiotrophies, and is understandable if we accept the notion that the psychoses are also abiotrophies. The psychoses together may be regarded as a major group corresponding to the several groups of abiotrophies already mentioned, and each psychosis as a subtype containing a number of typical cases but not including the intermediate forms. *According to this deduction doubtful cases are to be regarded not only as apparently but also as actually, from the standpoint of pathology, intermediate to the typical cases.*

Relation of Mental Disturbance to Structural Changes

This conclusion clearly does not jibe with some of our present ideas with regard to the psychoses. Take the matter of variability in mental symptoms which occurs in all psychoses. Variability does not appear to be consistent with a relatively even, progressing process. Kraepelin specifically refers to this point in discussing dementia precox and accepts Bleuler's division of symptoms into the two groups, fundamental and accompanying. The fundamental symptoms, which are seen naked in dementia simplex and terminal states, he accepts as directly related to the basic pathological process, and believes that they persist through remissions. The accompanying symptoms, the hallucinations, delusions, excitement, etc., on the other hand, are regarded as in a sense accidental and as the result of a breaking down of the psychic mechanism. Accessory factors enter into their causation, such as fear, worry, grief, infection. They are clearly defensive in nature, and if conditions are right may be, and indeed often are, avoided for periods of many years. They will vary, depending on many factors. While not occurring without the existence of the basic process, they do not develop unless further etiological factors enter in.

Manic-depressive psychosis presents a more difficult problem because deterioration is said not to be a part of it. Yet this fact has been denied and by no less an authority than Mott. Certainly the manic patient rarely returns to a perfect state of nervous equi-

librium, and as the years pass is apt to show more and more instability. We must not think that the deteriorations of dementia precox is the only form, for other varieties are encountered in epilepsy, Huntington's chorea, and other conditions. The deterioration of manic-depressive is probably different from that of precox because a different group of structures are affected. The result is that in the intervals the deterioration is less evident, the symptoms of the attacks are different, and mental equilibrium is more easily restored.

These remarks immediately suggest the question of the relation of mental defect to structural alteration. In the various conditions in which deterioration occurs—dementia precox, manic-depressive, epilepsy, Huntington's chorea—the defect is distinctive in each case. We have assumed that a different group of structures are destroyed in each instance. It thus appears that a number of groups of structures are important in normal mental functioning, but not indispensable to a relative normalcy. To take a homely simile, the gasoline engine runs, but not perfectly, when one of the cylinders is missing, and the nature of the disturbance probably varies somewhat, depending on which cylinder is affected.

This is a fascinating and important subject and could be pursued further by including other conditions where deterioration appears. But for our purposes the present remarks are sufficient, as they bring out the point that *the variable, stormy symptoms of mental disorder are only secondarily related to the basic structural changes.*

Heredity

It is impossible to resist the temptation to bring up at this point the subject of heredity, although it is somewhat irrelevant to the main thesis. The abiotrophies afford information on this subject that should not be overlooked. Some of them are clearly very hereditary, for instance, the dystrophies, while others, *e.g.,* the atrophies, almost never give positive family histories of transmission. Between these two extremes every gradation occurs. Beside the inherited case, is always the case that arises spontaneously.

There is another important relation. With the spontaneously arising case transmission to succeeding generations may be evident in increasing degree, so that the stock is quickly eliminated. This is frequently observed in the dystrophies.

These two relations undoubtedly apply to mental disease, and they make clear obscure aspects of heredity that have led many to doubt its force. Their meaning from the standpoint of genetics is not clear but their validity cannot be doubted.

Summary

(1) The classification of mental disorders is directly dependent upon the problem of their causation.

(2) The psychoses are thought to be types of abiotrophy and, like other abiotrophies, to have their basis in degenerative changes of nervous structures that originate in inborn weakness.

(3) Upon viewing the abiotrophies it becomes evident that they are composed of unrelated groups (*e.g.,* the muscular atrophies, the dystrophies, the hereditary ataxias) within which are subtypes which are of identical nature and which are united by many and various intermediate forms.

(4) Reason to believe that a relation exists between the major psychoses is found (1) in the frequent difficulty of making differential diagnosis and (2) in the interrelationship shown by heredity.

(5) It is the conclusion, therefore, that the psychoses together form a major group of the abiotrophies and that the individual psychoses are merely subtypes analogous to the subtypes of the muscular dystrophies and atrophies. Between these subtypes it is assumed that various intermediate and atypical forms occur—a fact that accounts for the difficulty in labelling many psychotic cases.

(6) Heredity in the psychoses can better be understood by comparing what occurs in other abiotrophies.

Humboldt Bldg.

REFERENCES

1. Alford. Dementia Precox as a Type of Hereditary Degeneration. Amer. Jour. Psy., IV, 1924–25, p. 623.
2. Spiller. Diseases of the Motor Tracts. Osler's Modern Medicine. 2d edition, V.
3. Collier. Intrinsic Diseases of the Spinal Cord. Oxford Medicine, VI.
4. Barnes. The Myopathies, etc. Oxford Medicine, VI.
5. Freud. Die Infantile Cerebrallähmung. Vienna, 1897. Collier, Pathogenesis of Cerebral Diplegia. Brain, 1924, XLVII, p. 1. Mingazzini & Giannati. Zeit. f. d. ges. Neurol. u. Psychiat., 1924, vol. 90, p. 521.
6. Anderson. Diplegia. Oxford Medicine, VI.

POSTENCEPHALITIC RESPIRATORY DISORDERS

REVIEW OF THE SYNDROMY, CASE REPORTS AND DISCUSSION

By Smith Ely Jelliffe, M.D., Ph.D.

of New York

(*Continued from page* 477)

Reys[1] details an interesting case, analogous to our case II under the head of spasmodic cough.

In the course of a very grave myoclonic type the diaphragmatic myoclonia brought about very brusque expirations of extreme frequency which continuing day and night interfered with the patient's sleep. This situation was present in the acute phase and continued during the entire convalescence. The patient recovered from all his ocular and other myoclonic muscular movements but continued the breathing anomalies for at least two years. During the later phases parkinsonism developed. The extreme breathing seemed to be purely thoracic. The patient seemed to be always essouflé.

The mouth was held half open, the tongue dry, the effort at breathing dispneic and difficult as if the patient were out of breath. Radiographic study showed good diaphragmatic movements but diminished in their amplitude and increased in their rhythm. There was no paralysis of the diaphragm from phrenic involvement and the outhor attributed the changes to some central involvement.

Another type observed by Reys showed a diminution in the amplitude of respiration and an augmentation of its frequency. There were great inspirations followed by ample expirations at variable intervals. Yawning movements took place several times a minute. Reys is inclined to explain these anomalies not by implication of the respiratory pathways themselves but would run them back to bulbar implications. He promises further chemical studies.

Case report by **Leroy and Montassut**:[3]

C. M., twenty years old; had encephalitis September, 1921, retrospective diagnosis. February, 1922, much intellectual retardation, character changes, respiratory activity preceded by yawning; sent to Maison Blanche asylum. The respiratory attacks invariably influenced by emotion. It was of Type 1 of Marie and Lewy paroxysmal polynea without cyanosis or anxiety. Superior costal, diaphragmatic inertia.

[1] Reys, L. L'Encephalite épidémique. Maloine, Paris, 1922.

[3] Leroy et Montassut. Tics respiratoires et troubles mentaux au cours d'une encephalite épidémique fruste. De la puerilité encephalitique. Ann. med. Psych., LXXXI, 1923, 48.

Ballif[4] reports briefly three cases of respiratory difficulties as post-encephalitic resultants:

Case 1. The first entered the psychiatric service of Parhon at Jassy because of a great restlessness, irritability, and quarrelsomeness that made it impossible for his parents to control him at home. For causes unknown from time to time he would commence to breathe rapidly and noisily, would put his hands up to his mouth as though they were a cornet to blow, and then after a long respiration the attack would cease to recur within a few minutes or a few hours. The patient himself said he could not help it, an interior need was stronger than he. The author, not then aware of this strange performance as a post-encephalitic resultant, classed the patient as an hysterical or a beginning dementia precox.

Similarly his *second case,* a girl of twenty years, brought to the clinic for hysterical crises and respiratory troubles. She had suddenly undergone a change in character and had five to fifteen respiratory attacks a day. Sometimes they would be almost continuous for three to four hours. After them she would be exhausted. Some days she might be free from the attacks. Her breathing was quite irregular. It would be rapid, deep, and noisy; this would last two to three minutes; then it would be interrupted and mount again rapidly (pneumographic tracing) (Cheyne-Stokes type). Her eyes would be closed, head turned back (see Parker illustrations), an opisthotonos position be assumed, her head and heels alone on the bed. She would become cyanotic, pulse 90–120 to minute; then she would sink down exhausted. The attacks might persist five to eight minutes. During sleep she was free. Diagnosed pithiatism, treatment along lines of suggestion or drug therapy were unavailing.

Case 3, a fourteen-year-old boy, was interned because of his bizarre conduct. His respirations were wide, deep, noisy, and rapid, forty to the minute (pneumograph). They were accompanied by much psychomotor activity; he would clap his hands, make choreiform mouth grimaces, imitate the words and gestures of those about him, and was quarrelsome. A typical noctambulatory patient. Catatonic attitude, mask-like face, and so typical of the parkinsonian sequel of encephalitis that the two preceding cases were reviewed in the light of this one—thus considered post-encephalitic respiratory residuals.

Ballif and Marza[5] return to the same subject already presented by Ballif at a preceding meeting of the Roumanian psychiatric society (see previous abstract). Additional cases are presented, the accent chiefly being laid upon the mental changes.

Case 1. Post-encephalitic character changes, irritable, turbulent, disobedient, and insulting, and abusive to those about her. The respiratory

[4] Ballif, L. Tachypnée hystérique ou tachypnée post éncephalitique. Bull. de L'Assoc. Psychiatres Roumainis, IV, 1923, 96.

[5] Ballif, L., et Marza, V. Troubles respiratoires et mentaux sequelles d'éncephalite lethargique chez les enfants. Bull. Assoc. de Psychiatres Roumainis, V, 1923, 113.

crisis begins with rapid deep breathing; the head is thrown back, the eyes become staring, and then breathing stops for 3 to 100 seconds; the lips and face become cyanotic. Athetotic movements of the hands sometimes accompany the apneic phase. The respiration recommencing, she runs about, beating with the hands, and would murder those she might encounter. The urinary urge is strong and she will even urinate on the ground. When over her attack, she is sorry, apologizes, cries, says it is too strong for her and can't help it (pneumograph).

Case 2. Briefly cited, a girl of eleven, with agitation, polypnea, beating of hands, violence and mendacity towards her environment. Only under observation a week.

Case 3. A girl of fourteen, entered as epileptic since four years previously, when she probably had an attack of encephalitis with fever, delirium, insomnia. Her attacks are peculiar. She takes her head in her hands, falls to the ground or plunges her head against the ground or a wall. She has choreiform movements. The lips and face are cyanotic and she has typical rapid breathing spells, thirty to forty to the minute. She is very violent and would viciously assault her companions. She has frequent absences.

The case history is worthy of further elucidation, since it brings up quite forcibly the nature of "names" or "diagnoses," or "diseases" in medicine as logical fictions (see Vaihinger, "Philosophy of the As If"), a feature which is in constant need of iteration, since "names" are so frequently thought of in medicine instead of the "behavior of things."

Case 4. A twelve-year-old boy who went through an encephalitis attack. The respiratory tracing shown indicates very irregular and rapid breathing—Cheyne-Stokes in general character.

Urechia and Mihalescu[6] report the case of a girl nine years of age. Three years previously child had a chorea which was followed by changes in character, indifference, disobedience, obscene proposals, insomnia, and psychomotor agitations. There was arhythmia of the pulse, 60–96; more or less synchronous with respiratory disturbances. These were paroxysmal in their nature. With their onset the patient would bend forward or backward extremely and brusquely. If lying down she would stand up immediately and remain immobile. A period of apnea then comes on, during which the jugular veins are dilated, the pulse filiform and arhythmic. Towards the end of the attack one observes slight wheezing and a blowing respiratory noise. A period of polypnea then supervenes. These attacks last several minutes, and are not attended by unconsciousness.

Buzzard,[7] in opening a discussion on the sequelae, speaking of respiratory disorders, says:

[6] Urechia, C. I., et Mihalescu, S. Troubles de la Respiration, du Sommal et du Caractere chez une fillette de neuf ans, avec éncephalite. Bull. et Mém. Soc. des Hôp., XLVII, 1923, 210.

[7] Buzzard, E. F. Sequelae of Lethargic Encephalitis. Br. Med. Jl., Dec. 8, 1923, 1083.

"Various disorders in the nervous mechanism of respiration have been recorded in the literature of encephalitis. One of my patients, a young subject with a progressive parkinsonian syndrome, complained of shortness of breath which came on in attacks for no apparent reason. Under observation it appeared to me that from time to time involuntary respiration was replaced by voluntary and exaggerated breathing, but whether this was induced by failure of the involuntary mechanism it was impossible to determine.

In this same discussion led by Buzzard **Hinds-Howell**[8] says: "Peculiarities of respiration had been noted in 3 cases. In one, that of a girl aged twenty, about three months after the acute illness there developed an attack of dyspnea which lasted for about three weeks; she improved for a few weeks and then remained much as before; her respirations were 36 per minute, the pulse rate 80; these respiratory troubles had now ceased and the girl was in active employment, quite recovered. A second case exhibited a type of respiration which, although not of the true Cheyne-Stokes type, at times seemed to approximate to it, while the third had developed a most peculiar respiratory tic, in which the mouth was opened widely and usually towards one side and the platysma on that side thrown into contraction. There was no gasping inspiration accompanying this movement, but the patient said he did it in order to get his breath. He had no dyspnea and his respiratory rate was normal."

In this discussion led by Buzzard, **Symonds**[9] notes: Dr. Hinds-Howell had mentioned that in one of his cases there occurred gasping movements over which the patient had voluntary control. Dr. Symonds had met with cases in which the patient had made movements of a similar nature, and had explained them as being due to a sensation of impeded respiration and suffocation of which he had tried to rid himself by energetic deep breathing. Another instance of that type had been a man who had a perpetual sensation of nasal obstruction which impelled him to be constantly blowing and sniffing.

In 1924, Mlle. Lévy's Paris thesis, reprinted, contains the most interesting material; Wimmer's monograph also gives us a résumé but the clinical contributions are relatively scanty.

Van Bogaert and Sanz report cases. Rosenow's experimental studies on some of Parker's material might be mentioned here, also Novarro's short note, Motzfeldt's case, and the six cases of Suckow. Adelsberg and Porges' study on a new type of neurotic breathing

[8] Hinds-Howell, C. M. Sequelae of Lethargic Encephalitis. Br. Med. Jl., Dec. 23, 1923, p. 1086.

[9] Symonds, C. P. Sequelae of Lethargic Encephalitis. Br. Med. Jl., Dec. 8, 1923, p. 1089.

tetany also belongs to this year's contributions. These are all I have found directly pertinent to our subject.

Wimmer[1] in his most fascinating monograph has paid particular attention to these respiratory syndromes and has given one of the best discussions extant. He notes their frequent occurrence in acute encephalitis but devotes special attention to the chronic form constituting, as he says, often a very grotesque "hysteriform" type, maybe occurring with parkinsonism or with other complex symptoms. He notes their monosymptomatic appearance as well and quotes a number of the others here cited, following in general Marie and Lévy in their classification. With him polypnea is of most frequent occurrence and the attacks last variable lengths of time. With him bradypnea is more rare and is also phasic in its type.

Respiratory tics, such as sniffing, hawking, spitting, noisy puffing, or hissing or snorting through the nose or through the mouth have also been observed by him.

He says (page 71) "the peculiar grotesque pictures afforded by these respiratory disorders, their coincidence with psychotic, general nervous, 'hysteriform' or 'neurastheniform' troubles, their being 'punctual to the hour,' their liability to being influenced by psychic factors, and finally their frequent monosymptomatic appearance, at any rate for a time, all these features may delude one into conceiving them as purely hysterical. Semiologically, too, they often show a considerable resemblance to the respiratory disturbances found in true hysteria. A psychogenic blending cannot, of course, be totally disregarded, especially inasmuch as the initial and purely organogenic attack may, during its further development, become tainted by reactive anxiety symptoms."

Respiratory troubles in his patients are more moderate. Serial yawning or sighing (Case 8), sighing and hiccoughing with or without abdominal myoclonia (Case 41), awakening with polypnea and being out of breath as if the patient had run upstairs to the 4th floor (Case 55). In Case 4, periodic bradypnea was very striking. In Case 11, the tachypneic attacks came on during the night, with trumpeting sounds, a laryngoscopic examination revealed a tremor of the soft palate and vocal cords. "In the patient mentioned as Case 46, the respiratory disturbances (tachypnea, arythymia) accompanied the exacerbations of muscular unrest. Also at times when there were no actual attacks—and when the respiratory type was not changed to any essential degree—the stethoscopic examination revealed a markedly saccadé respiration, suggesting a diaphragmatic spasm, or the like, as demonstrated by means of the radiogram by Vincent and Benard, and Laignel-Lavastine and Maginot, in their cases."

"A small girl under my observation, who did not show any other

[1] Wimmer, Aug. Chronic Epidemic Encephalitis. London, 1924.

morbid signs than disorders of sleep, had a respiratory tic consisting in a persisting blowing upon her fingers, as though they were numbed by cold."

"Case 12, a girl of eighteen years, admitted to my department November 28, 1923, and who is still under my care, shows respiratory troubles of a more peculiar kind, for a time manifesting themselves mostly as paroxysmal yawning, as described in the cases of Sicard and Paraf, Mayer and de Saussure, and as mentioned also in my cases 7 and 10." Also see case 22.

"Gradually, her yawning tics changed into more pronounced paroxysms of polypnea."

Van Bogaert [2] reports a chronic encephalitic thirty-three years of age, unmarried, starting with a so-called intestinal grippe, with later a diplopia, intermittent fever and persistent insomnia. The patient made a good recovery apparently after two weeks without residual symptoms and was well for a year. One day following some emotional upset she had a slight respiratory difficulty and shortly thereafter had a slight passing fever with jaundice. She was also quite sleepy. The patient was sleepy for three months and developed salivation, slight tremor and some dyspnea. This dyspnea was especially marked postprandially (see Jelliffe case I where the breathing attacks were always worse at meals, especially at breakfast). Difficulty in breathing through the nose in attacks of an hour or so were quite marked. The dyspnea then started when any effort was made. Finally it became almost continuous. The tremor was of the intentional type, greater in the right hand; the face is somewhat seborrhoric. In March, 1922 (2 year) polypnea 38 to the minute was present. The excursions are quite irregular and interrupted by complaints of stuffiness. Cheyne-Stokes respiration shows at times and at times there is a respiratory arhythmia. Lying down reduces the rate of breathing. Van Bogaert does not follow Beriel in his interpretation of the compensatory nature of the polypnea to the micropnea of the parkinsonian rigidity. As may be seen from our psychoanalytic observations this interpretation is not valid.

Sanz [3] writes that an abbreviated report of a case was presented before the Spanish Medico-chirurgical society of Madrid by Sanchis Banus, February 26, 1923 (not found by us), which formed the stimulus for this report with which the author compares this case of his.

Case 1. A thirty-year-old man had an encephalitis with fever, delirium, double vision, etc. He entered into a chronic state of his illness with muscular rigidity and later developed a respiratory disturbance

[2] Van Bogaert, L. Encephalite léthargique avec syndrome respiratoire et hepatique. Journal de Neurol. et Psych., No. 1, 1924, January.

[3] Sanz, E. F. Sindrome respiratorio post-encefalitico. Arch. de Neurobiologia, IV, 1924, 16.

which had persisted without much alteration for a number of months. The respiratory anomaly consisted in an extreme increase in the rapidity of breathing to about 70 to the minute. By strong effort, or if such interested in something else the rapidity of the breathing would be temporarily diminished. Also there would occur paroxysmal exacerbations in the course of this rapid breathing during which the rate would be increased to 80 to 90 to the minute. Inspirations are noisy and quite apparent to the eye. As for the expirations they are much shorter, less brusque and also noisy. Pharmacotherapy was of no avail.

Rosenow's [4] experimental work does not belong here but since he used Parker's cases we have cited it. Cases 1, 2, 3, three of Parker's cases, used for experimental work on rabbits. His case 4, a girl of thirteen, had a peculiar attack of deep breathing which lasted several hours. Case 5 was a woman twenty-seven years of age. Neither of these cases could be reasonably thought of as post-encephalitis respiratory attacks. Case 6, a boy of seventeen, had an irregular post-encephalitic respiratory affection. Case 7 was an acute influenza.

The experiments show that rabbits and sometimes monkeys are specially susceptible to infections, but the evidence as to etiology or to reproduction of symptoms is quite insufficient. We are totally unconvinced thus far that the results in lower animals have any real relationships to the disease of human beings. [See Jahnel. Zeit. f. d. g. N. & P., 1925.]

Navarro [5] gives a short study. *Case 2.* J. A. (p. 11). A ten-year-old child who had a febrile affection in November, 1922, with agitation, insomnia, confusion and some tonic convulsions. Seen in December, 1923—greatly exaggerated respiratory movements, both inspiration and expiration being noisy and also much more rapid. These respiratory changes are not permanent but are paroxysmal. See later (p. 17) in September, 1924, the respiratory attacks had improved but she had an attack during the interview with noisy deep and rapid respirations which lasted for a short time (algunos instantes) during which the patient was completely conscious.

Motzfeldt's [6] case is of a twenty-year old student who had an encephalitis attack in 1920 with diplopia and loss of patellar reflexes. First seen in 1922. From the first the respirations were very characteristic. The otherwise tranquil respirations were rapid and were interspersed by periods of tachypnea. Frequently the respiration rose to 40 or 50 to

[4] Rosenow, E. C. Experiments on the Etiology of Respiratory Arhythmias Following Epidemic Encephalitis. Am. Arch. of Neur. & Psych., XI, 1924, 155.

[5] Navarro, J. C. Secuelas de encefalitis letargica. Rev. d. l. Ass. Med. Argent, XXXVII, 1924, 7, No. 231, June.

[6] Motzfeldt, K. Tachypnea After Encephalitis Lethargica. Norsk. Mag. f. Laeger, 1924, 225.

the minute—expirations of varying types, noisy or stertorous. Nothing of the Cheyne-Stokes variety. These periods would last mostly from 3 to 5 minutes. The patient could by will power bring the respiration back to normal. "To the outside world these paroxysmal respiratory anomalies seemed to behave like asthma. There was no adiposity, tremor, nor polyuria. This condition remained unchanged throughout the period of 45 days that I observed him during the summer of 1922."

Adlersberg and Porges[7] would erect a new clinical form of tetany which they term "neurotic" and which is conditioned upon hyperventilation of the lungs. As has been known since Vernon's experiments in 1909 and for some years previously, excessive breathing may cause a relative alkalosis of the blood from too active an oxidation, which secondarily by faulty calcium supply or over calcium utilization leads to that type of hypermotility often designated as tetany, or spasmophilia. They here separate it from other tetany types and report 21 cases arranged under three rubrics: (1) Acute cases, 8 in number, occurring in excitable nervous women between twenty-three and fifty years. The breathing attacks which led to tetanoid symptoms followed some shock which led up to a high grade of excitement with dyspnea. Group (2). Cases with a chronic course on an encephalitic or hysterical foundation. Here 5 cases are reported, one excellent pneumograph (comparable to present case) in a so-called "hysterical" patient. Here the forced breathing attacks are accompanied by the tetany-like cramps, the changes in the CO_2 blood concentration, the pH and the calcium content.

Group (3) takes up 8 cases where breathing attacks accompany cardiac disease (mitral) with or without other valvular defect. Six had a perpetual cardiac arhythmia.

This is an interesting study which should be read with the work of Rosett, which does not seem known to these workers.

Suckow[8] has here given a very complete study of the phenomena, first presenting a rapid summary of the previous studies of both the acute and chronic situations. He then presents a series of cases observed by himself.

Case 1. A thirty-eight-year-old laborer who had a light grip attack in October, 1918. In the spring of 1919 he first noted weakness of his legs and then mouth twitches which interfered with chewing and swallowing. In November, 1919, he had insomnia lasting some time. In November, 1920, he came into the Berlin Psychiatric clinic with developing parkinsonism which by May, 1922, was severe. His respiratory

[7] Adlersberg, D., and Porges, O. Die neurotische Atmungstetanie eine neue klinische Tetanieform. Vienna, 1924.

[8] Suckow, Johannes. Atemstörungen bei der Encephalitis Epidemica. Monat. f. P. u. N., LVI, 1924, 317.

difficulties were first of a sense of constriction in the chest which X-ray examinations showed are due to a micropnea from slowed diaphragmatic cramp-like movements. Deep sighing inspirations were also present. These are illustrated by curves.

Case 2. A barber fifty-seven years old. Acute encephalitic stormy onset January, 1922. In November, 1922, at the clinic he showed residuals of his encephalitis with difficulty in breathing due to X-ray demonstrable slow asymmetrical diaphragmatic contractions.

Case 3. A thirty-six-year-old official who in January, 1920, had a mild grippe attack with later pain in the back and then a tremor of the left foot. Insomnia. By October his legs were stiff and his gait slowed. He then had rapid and wheezy breathing which by April, 1922, had become continuous even persisting during his sleep and only discontinued during eating and writing. By February, 1923, he must be fed, marked salivation, sweat and tear excretion. The breathing became better appearing then only in attacks. X-ray showed a rigid diaphragm. In the attack-free intervals the breathing is difficult, slow and small. The alternations of tachypnea and micropnea resemble somewhat Jeliffe's case I but the attack is not so stereotyped and no trance states or tetanoid features were present.

Case 4. A twenty-year-old laborer with grippe-like encephalitic onset with ptosis in January, 1921. Then typical choreatic movements. By June, 1921, he developed coughing breathing attacks attributed to a tickling in the throat. These diminished somewhat but the breathing still showed a strong expiratory push which on admission to the clinic in March, 1923, showed a strong expiratory cough-like character. Salivation was later marked. No X-ray findings of the diaphragm, but a gradually developing irregular tachypnea.

Case 5. A schoolboy of thirteen who had an acute disturbance in January, 1921, with delirium lasting 2 days and then lethargy for 14 days. Late in February he went to school and then a period of insomnia intervened. He was sleepy in his classes and had to give up. Choreatic movements and restlessness followed and he became irritable, difficult to control, teased his associates. In May, 1922, the breathing became frequent and hasty and in June entered the clinic. Here he had frequent attacks of rapid breathing with much spitting, bending over almost to the floor. After an attack he rights himself and sticks out his stomach. By March, 1923, the breathing attacks were characterized by rapid breathing, nasal blowing with much mucus which he smears over his face. During periods of apnea X-ray examination of the diaphragm shows it to be in a fixed inspiratory position. In tachypnea the diaphragmatic movements are directed backwards. The illustrations show bodily postures similar to a number of other cases, the author citing those of Urechia and Mihalescu, and Francioni.

Case 6. A seven-year-old boy who in January, 1920, had an attack of delirium with phantasies of water, canoes and sailboats. In June,

1920, he entered the clinic where he had an inverted sleep formula, choreic movements, at night standing up in bed, talking out loud, whistling and uncontrollable. He improved but on readmission was hypomanic and then developed wheezing, rapid, rhythmic breathing attacks with open mouth which would last an hour at a time. He became unruly, was dirty, spit over everything and smeared things with feces as if to attract attention, which motive seemed to be present in his breathing attacks. By February, 1922, the breathing attacks became more frequent and he showed angry aggressive activities alternating with tender expressions of affection. The X-ray studies of the diaphragm showed no marked tonus.

Suckow then discusses these six cases particularly with reference to the hyperkinetic and akinetic breathing activities as shown in the chest and diaphragm and illustrated by many curves. The analogies to other muscular activities in post-encephalitic parkinsonism are discussed. In general the author goes no further for the explanations that "irritation of breathing centers" (p. 343), calling attention to certain of the more recent studies upon the vegetative nuclei. Of psychogenetic components there is no mention.

In 1925, Boyd's second study of the Winnipeg epidemic contains some excellent material; Witzel publishes some notes confirmatory of some of Runge's and our own findings, and Turner and Critchley give an extended study which, were it not for certain omissions contributed to by our own study and those of Runge and Witzel, might have made it unnecessary for us to have prepared this present paper, so complete and detailed is their handling of the subject.

Gamble, Pepper and Muller's report is also of special moment here.

Boyd [9] writes: "Out of a number of striking examples of this condition the following history may be quoted. The case was a typical one of encephalitis with marked lethargy. During the acute stage the respirations were somewhat rapid, averaging 32 per minute. The temperature was slightly elevated. At the end of two weeks the temperature returned to normal, but the respirations increased in rate to 50 or 60 per minute. The rate gradually went up, and when the patient was discharged, very greatly improved, at the end of three months, the average rate was 70 to 80 per minute. Some four months later he was readmitted to hospital complaining of shortness of breath and weakness. On seeing the patient one was immediately struck by the very rapid and shallow respirations, which were between 80 and 90 per minute. During sleep

[9] Boyd, William. Epidemic Encephalitis: The Second Winnipeg Outbreak. Quart. Jl. Med., January, 1925.

the rate was only slightly slower. This rate was maintained until the patient was discharged a few weeks later.

Witzel[1] deals with a number of cases in which respiratory attacks were present and which in three cases made definite responses to psychoanalytic treatment comparable to Jelliffe's patient I. The details of the breathing spells are not extensive, the accent being placed upon what he designates the psychoneurotic element.

Case 2. A fourteen-year-old girl, at twelve, December, 1919, had a short period of influenza with brief hallucinatory episode "seeing her girl chums in the room." Changes in character followed. These consisted of irritability, irascibility, stubbornness, sleep in day and awake at night. A year later rapid, labored breathing. At the age of eleven two boys, older than she, masturbated in front of her, this being followed by manipulation of her genitals by one of them, a cousin. It was then revealed that this act on the part of the cousin was accompanied by this type of breathing, as was subsequent masturbation. Also, following the experience with the cousin whom she associated with her father, and for whom there was a very strong attachment, she had witnessed on several occasions the sexual act of the parents, each time becoming tense and having difficulty in breathing. She also wished that she could take the mother's place.

Case 3. A girl of fourteen, encephalitis in December, 1920. February, 1921, she had rapid forced breathing. At the age of fourteen, just prior to her illness, boys considerably older than she urinated in front of her. This was followed by asking her "to be bad with them." One of them threw her on the ground and tried to touch her genitals. She became frightened, struggled, and afterwards it was difficult for her to get her breath. After she became ill she began to think of the male organ, became upset, and displayed dyspnea. Since then the thought or sight of a male brought on the type of respirations described. This act on the part of the boys was repressed; a conflict had arisen when she thought of telling about it to the mother, because of fear of the mother's reprimand. When previously censured by the mother there had always been a fear reaction. It was later revealed that there was a marked dislike of the mother. Her reaction to this was shown by throwing things at and striking the mother during her illness.

Case 4. An eighteen-year-old male. History of masturbation and forced respiratory movements and facial tics during the masturbation. No history of an encephalitis. The act of masturbation was always accompanied by labored breathing and facial spasms on ejaculation. In this case there was also a marked attachment to the mother and a corresponding dislike of the father. In connection with onanisms he always

[1] Witzel, A. E. Epidemic Encephalitis and the Psychoneuroses. State Hospital Quarterly, X, 1925, 387, May.

thought of a school teacher, a sister, whom he associated with his mother. As stated before, attempts at repression of this act were made, especially by the father, who, when he caught the boy at it, would put him in a tub full of cold water or chastise him physically. He would first become tense with either procedure, then with relaxation would breathe, according to him, "as if I had run a hundred yard dash."

It seemed to the writer that in each instance repression had been at work, and that the material came from an unconscious level.

Fig. 2. Photograph of Case 1 taken during the phase of inspiratory apnea. The tongue is seen protuded between the inverted lips, the face is rapidly becoming congested.

With psychotherapy these respiratory disturbances disappeared in Cases 2 and 4, and were lessened to a marked degree in Case 3, who was transferred from the service before the investigation was completed.

Turner and Critchley's [2] study is the most complete general account in English of the post-encephalitic respiratory disturbances which has appeared to date. The authors open with short discussion of the respiratory disorders of the acute stage which will not be entered into here and then present an almost complete résumé of the various cases reported of post-encephalitic respiratory disturbance with an exhaustive analysis

[2] Turner, W. A., and Critchley, M. Respiratory Disorders in Epidemic Encephalitis. Brain, XLVIII, 1925, 72, May.

of the clinical syndromy including respiratory tics, the pathogenesis, diagnosis and treatment. They emphasize the bad prognosis of this particular diaschitic syndrome and say that the clumsier forms of psychotherapy such as suggestion, hypnosis, anesthesia by faradism are of little or no avail. *

Case 1. Boy of sixteen who two weeks before Easter, 1924, had drowsy spells, followed by Easter by restlessness, headache and fever,

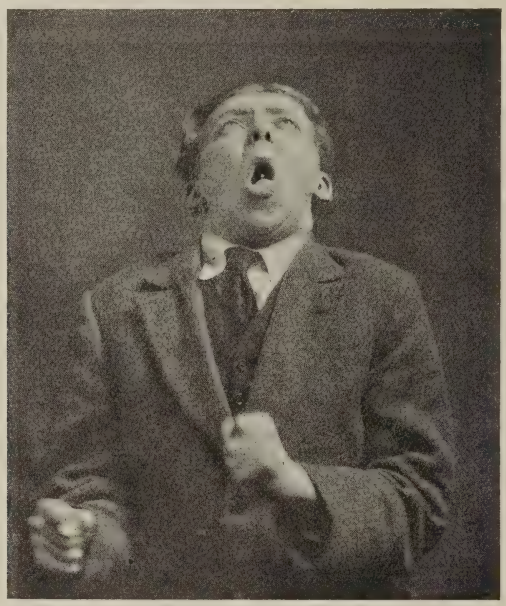


FIG. 3. Same patient as in FIG. 2, taken at the moment of the forced expiratory effort. The face is seen distorted into an extraordinary grimace, the mouth opened widely, the eyes deviated upwards and the head thrown back. The facial congestion has given place to extreme pallor. Note the clenching of the fists.

then a four-day delirium, chiefly utilizing his occupation. He convalesced slowly. A month after the onset he had a nervous cough. The latter part of September, 1924, he would suddenly waken from his sleep. He then had a "faint," and then he had a series of "turns" which became almost continuous. These turns are combined respiratory and motor activities. The attacks occurred at first every thirty seconds. They begin with a few deep and labored respirations which increase in depth and intensity and sometimes accompanied by a hacking cough. A period of apnea follows, the chest being held in full inspiratory distension. The face becomes cyanosed, the forearms are flexed and pronated,

* I am greatly indebted to Drs. Turner and Critchley for the permission to reproduce photographs and tracings of these cases, and to Dr. Gordon Holmes, editor of *Brain,* and the Macmillans for the use of the clichés.

to fists tightly closed, the neck and back arched in opisthotonos and then a series of rubbing hand on chest, clawing air, clenching and unclenching the fists occurs, the veins stand out, exophthalmos develops and the tongue protrudes and after a long expiration the phase is over. The cycle occupies 20 to 30 seconds (figures) and may be repeated as many as 13 times in 5 minutes. These attacks continued despite all therapy,

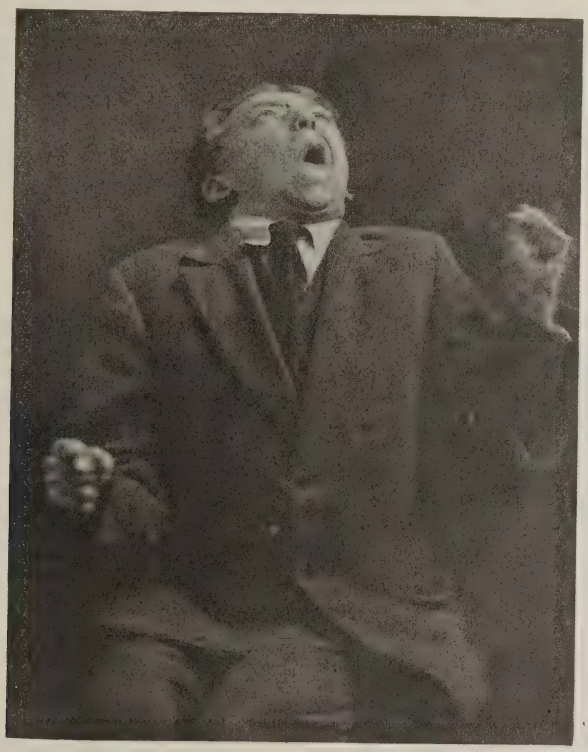


Fig. 4. Same patient taken during the third and final stage of the respiratory cycle, *viz.,* during the period of expiratory apnea. The head is slightly turned to the left, the left side of the face is in a state of spasm. Both fists are clenched and the left arm is in the process of being flexed and externally rotated.

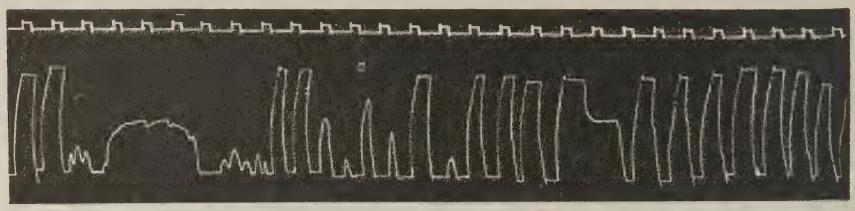
but are partly controllable by effort. He later showed some exhaustion, almost fecal incontinence and some religious delusional thinking.

Case 2. Male, twenty-six, who had encephalitis in January, 1920, lasting 4 to 6 weeks with later parkinsonism. In September, 1923, exaggerated yawning movements occurred. (See illustration.)

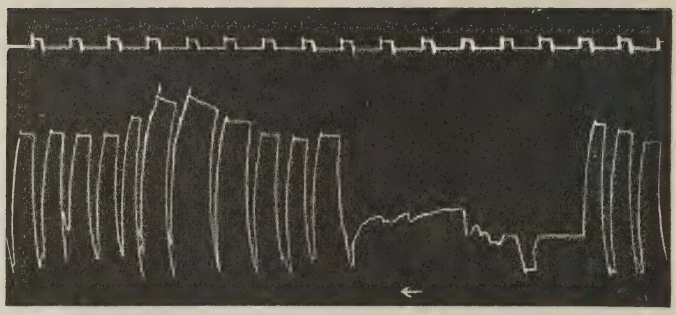
Case 3. Girl of fifteen who had an encephalitis 7 months previous to hospital admission. During the day the respiration was normal. At night in bed she had difficulty in getting her breath and was restless.

When asleep her respiration was interrupted by irregular apneic pauses and sighs accompanied by irregular torsion movements of the limbs.

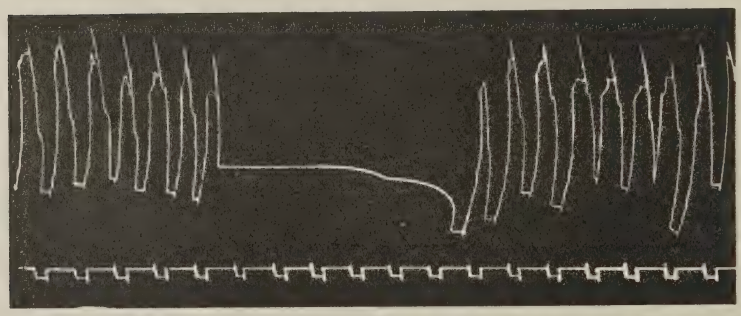
Case 4. Butcher of nineteen who in March, 1924, had an attack of encephalitis followed by a persisting myoclonus. He became mentally



x y z



x y z



x y

Figs. 6, 7, 8. Pneumograms of Case 1 showing respirations irregular in time and spacing, interspersed with periods of apnea, (x) apnea in almost full inspiration, (y) forceful expiratory effort, (z) short periods of acapnia.

dull. In February, 1925, he showed rapid and noisy breathing (40). The respirations were irregular in amplitude and in time. Inspiration is short and abrupt and is followed by a short inspiratory pause. Expiration is slow and is pulled up quickly by the onset of the succeeding abrupt inspiration. Myoclonic movements of the upper recti abdominis and of the shoulder muscles accompany respiration and synchronize with the onset of each inspiration (compare Marinesco's case). During sleep the breathing is even faster (60 to minute) and noisy. Inspiration is nasal and strident and is longer than expiration. There is no pause between the inspiratory and expiratory components but after each exhalation

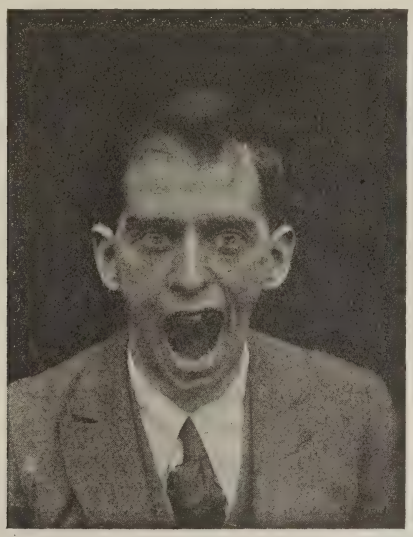
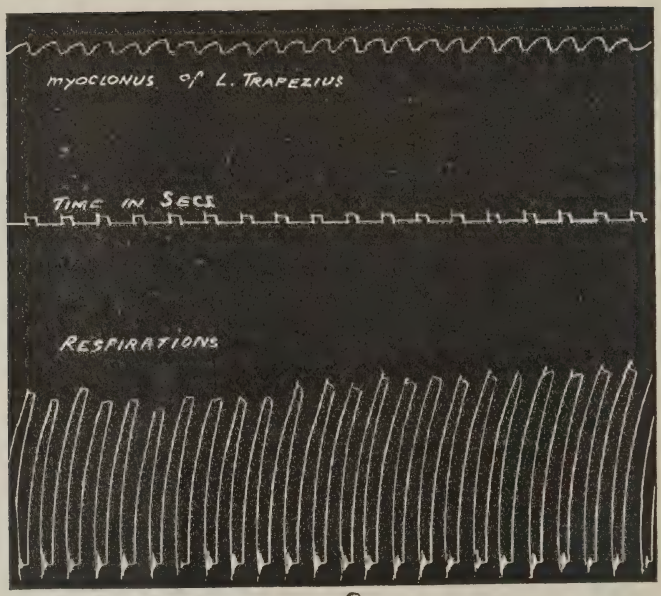
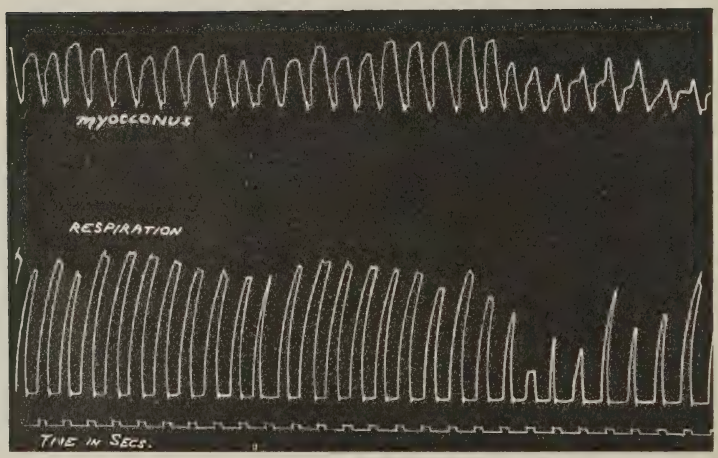


Fig. 10. Photograph of Case 2 illustrating the wide involuntary opening of the mouth.

there is a momentary period of apnea. The myoclonic movements are not then apparent. Radioscopy shows full diaphragmatic excursions.

Case 5. Female of twenty-two who in July, 1923, had an acute encephalitis while in Australia. In February, 1924, rapid breathing attacks appeared which continued all day but with no distress. Later she noted tingling and cramps in her hands and feet and in the left side of her face. In March, 1924, these paroxysms of polypnea were now frequently followed by " fits " in which she became rigid and cyanosed and lost consciousness for a few seconds. These attacks were nearly always nocturnal. No tongue biting nor micturition. With severe panting attacks tetanic cramps of the hands occur. (See Barker and Sprunt's case and Jelliffe's case I.) Chvostek on the left side of face present.





FIGS. 11a and 11b. Tracing taken from Case 4 recording simultaneously myoclonic movements of the left trapezius and respiration. Note the rapid rate of breathing, and also the synchrony between the myoclonus and the respiration.

Case 6. Male, twenty-five, who in March, 1924, had an encephalitis and in June, 1924, a relapse with return of delirium, reversal of sleep habit and the onset of breathing difficulties. He breathes deeply and rapidly and forcefully in order to "get air into his lungs." "Pulsations in his nerves" he says occur. The respirations are shallow and rapid, 24 to 70 to minute, irregular in time and amplitude and rather noisy. Inspiration is normal but expiration is cogwheel or broken in character. The upper thorax is immobile becoming fixed in a position midway between inspiration and expiration. Breathing is almost entirely diaphragmatic and the lower intercostal spaces are indrawn to an unusual degree. Only the alae nasi of the extrarespiratory muscles are used. The tachypnea is paroxysmal in appearance, but the cogwheel character is constant. The attacks tend to become worse at nightfall. The diaphragm is freely movable.

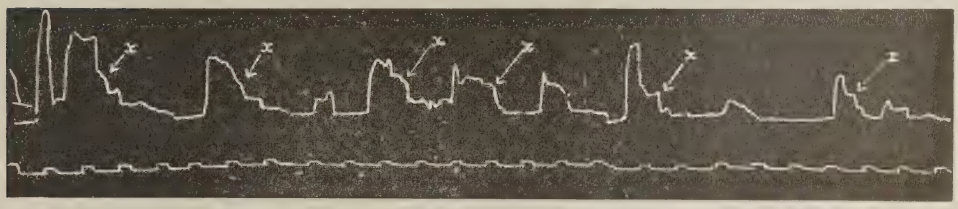


Fig. 12. Tracing taken from the lower costal cartilages of Case 6 showing shallow respirations which are irregular in time and amplitude. Note the peculiar broken or "saccadé" character of the expiratory component as shown by the down stroke of the respiratory curve (x).

Case 7. A stoker, fifty-five years old, who had an acute encephalitis with headache, lethargy, delirium, and diplopia with respiratory symptoms which persisted as residuals. The breathing was rapid, 26 to 64, irregular with noisy saccadé and shallow respirations, as though the diaphragm were in a state of tremor (see Laignel-Lavastine). Breathing was at no time normal but tended to become worse in paroxysms. The tachypnea persisted during sleep. After six months in the hospital the tachypnea persisted.

Critchley[3] reports for **Collier** two cases at the March meeting of the Royal Society.

Case 1. E. S., a butcher boy, aged nineteen. In March, 1924, had an attack of epidemic encephalitis, characterized by insomnia, delirium and myoclonus of the shoulder muscles. The patient's recovery was

[3] Critchley, Macdonald (for James Collier, M.D.). Case of Postencephalitic Myoclonus and Tachypnoea. Proc. Royal Soc., Section Neurology, June, 1925 (March 7).

never complete; he became dull in mentality. Insomnia gave place to lethargy, and the twitching of the muscles persisted.

His present state is one of mild parkinsonism. There is definite myoclonus in the upper halves of both trapezii, and to a less degree in the pectoralis, deltoid, biceps and triceps of the left side. The upper bellies of the recti abdominis also show myoclonus. These movements cease during sleep.

The respiration is rapid (40 per minute), and each inspiration synchronizes with the myoclonic jerk. The breathing is noisy, especially during sleep. The tachypnea, which persists throughout day and night, is not accompanied by any thoracic distress.

Case 2.[4] I. C., female, aged twenty-three. Last June was attacked with acute epidemic encephalitis (diplopia; delirium). Patient has never made a complete recovery from this illness.

Gradual onset of parkinsonism. Patient states that ever since last June her right hand has been contracted. At present the right hand is claw-like in attitude. Feeble flexion is possible, but extension is impossible. The right elbow is also contracted and cannot be extended past a right angle. The left elbow cannot be extended to more than 120°. Both legs are fixed in extension and the feet are drawn up in an exaggerated pes equinus attitude.

Patient's respiration is normal during the waking state, but when asleep the breathing becomes faster (38 per minute), regular, and shallow.

Gamble, Pepper and Muller[5] report an interesting case which terminates this summary of the literature. It concerns a Polish male of 38 years who probably had an encephalitis in Nov., 1924. He had an initial delirium and improved but by Jan. 13, 1925, he began to breath fast and hard and had to be propped up on several pillows. He went to the Hospital of the University of Philadelphia. He there showed mild right hemianesthesia, seventh and eighth nerve involvement, pupillary changes, 84 to the minute, horizontal mystagmus, marked tachypnea and partial closure of left fist during the paroxysms. Pneumographic study showed apparently no thoracic involvement but marked diaphragmatic myoclonic movements which accounted for the tachypnea. There was breath holding, the thoracic rhythm became a 2-1, an inspiration following after every second tic. The condition was obscured

[4] Critchley, Macdonald (for James Collier, M.D.). Case of Postencephalitic Contractures and Paroxysmal Tachypnoea. Proc. Royal Soc., Section Neurology, June, 1925 (March).

[5] Gamble, C. J., Pepper, O. H. P., Muller, G. P. Postencephalitic Tic of the Diaphragm. Pulmonary Overventilation and Relief by Blockade of the Phrenic Nerves. J. A. M. A., 85, 1925, 1485.

during sleep. The diaphragm would move when the breath was voluntarily held. During normal thoracic breathing the diaphragm followed the t'c pattern. Overventilation was evident and blood study showed character.stic alkalosis. Page No. was 73.

The most interesting feature of thi5 case report was that a surgical blocking by ethyl chloride spray free ing was done upon each phrenic nerve. During the operation the re pirations fell from 96 to 20 per minute. The rel.ef was permanent up to the time of publication, 7 months, i. e., Oct. 27, 1925. Pneumographic tracings showed normal breathing. Further observations are promised.

(To be continued)

Society Proceedings

NEW YORK NEUROLOGICAL SOCIETY

The Four Hundred and Twenty-Seventh Regular Meeting, March 2, 1926, the President, Dr. I. Abrahamson, Presiding

Symposium from the Neurological Service of the Mt. Sinai Hospital

A CASE OF TOXEMIA PRESENTING UNUSUAL CLINICAL MANIFESTATIONS, WITH RECOVERY

Dr. E. E. Arnheim

(by invitation)

A woman, dressmaker, was admitted to Mount Sinai Hospital, December 13, 1925, with a history of headaches for four months, vomiting for four weeks, and edema of the face for one week.

On examination she was found to have edema of the face, "urinous" breath, anemia, enlarged heart, mass in the right paraumbilical region, hypertension, and urine of low specific gravity, albuminuria, and casts. Immediately after admission she began to have severe generalized convulsions. A diagnosis of uremia was made, but the blood chemistry figures were normal.

She was transferred to the neurological service on December 29th, because at various times she presented abnormal neurological findings: papilledema, signs of meningeal irritation, transient amaurosis, and at one time definite focal signs, such as hyperactive deep reflexes on the right with absent abdominals, Babinski, and central right facial weakness.

The patient was discharged from the hospital January 23d. During her stay there was a gradual clearing up of practically all of the abnormal findings: convulsions, albuminuria, microscopic picture of the urine, high blood pressure, jaundice, and papilledema. On discharge the only abnormal findings were: unequal pupils, left greater than right; a slight nystagmus in horizontal planes, and a slight secondary anemia. At the present time, March, 1926, even these abnormal findings have disappeared. Her blood and spinal fluid Wassermanns have been negative.

The case is a remarkable one because about every other day a new diagnosis was entertained, and because of her complete recovery. The only condition that could explain the multiplicity of findings in this case is a toxemia of some kind with toxic effects—cerebral, renal,

vascular, and hepatic. An infectious element is likely because a severe angina started her more serious illness four weeks ago, and a review of the temperature chart showed that she always ran a slight fever with a coincident leucocytosis, her temperature dropping when the condition improved.

Arsenic was found several times in samples of the patient's urine in fairly large amounts. Clinically, however, the case did not resemble arsenic poisoning, and the source of arsenic, after long search, has not been revealed. However, the case is considered to be one of chronic arsenic poisoning for four months, with an infectious process superimposed.

SUBARACHNOID HEMORRHAGE

Dr. M. Grossman and Dr. D. Arbuse
(by invitation)

Five cases form the basis of the paper. In all of the patients there was an abrupt onset with severe headaches, accompanied by nausea and persistent vomiting, and with pain and stiffness of the neck. Most showed clouding of consciousness which varied from irritability to coma. The signs of focal disease of the brain were slight, but all showed evidence of meningeal involvement and a blood-stained cerebrospinal fluid. Three had fever on admission, and the other two subsequently. The blood and spinal fluid Wassermann was negative in all.

Case 1—A forty-eight-year-old housewife was admitted with the history that she suddenly began to suffer from severe headache eight days previously. The next day, pain, stiffness of the neck, and vomiting began. The vomiting lasted for two days; the pain, stiffness, and headache became progressively worse. The day before admission she began to have chills and some fever. She was acutely ill; T., 100.5°; urine showed a trace of albumin; blood pressure 140/80. The following were noted: Tenderness to percussion over the entire skull; both pupils dilated; right reacted more promptly to light than left; there was some hyperemia and blurring of the margin of the right disc; slight ptosis of the left eyelid; slight weakness of both external recti; facial asymmetry with deviation of the tongue to the right; deep reflexes of upper extremities were diminished; knee and ankle jerks were absent; abdominal reflexes were present, and there was no Babinski. There were marked rigidity of the neck and a bilateral Kernig. Lumbar puncture yielded a uniformly bloody spinal fluid under moderate pressure; a second lumbar puncture two days later showed a similar fluid. She was discharged apparently well twenty days after the onset of her illness. Ten months later she was still well, but since that time she was said to have died through an accident the nature of which could not be ascertained.

Case 2—A thirty-two-year-old truck driver, entered the hospital complaining of severe headache and vomiting of nine days' duration. His illness began abruptly while lifting a heavy weight; he became

weak, and "things suddenly became dark before his eyes." He was unable to continue his work and started for home; on the way he vomited and began to have a severe headache. He went to bed and on account of severe nausea he induced vomiting. He remained in bed two days, and then felt well enough to return to work. He was nauseated but stayed at his work the next day; on arriving home he again induced vomiting without relief. His family physician found a rigid neck, bilateral Kernig, and a positive right Babinski. Lumbar puncture showed a bloody spinal fluid. Five days before admission he had some difficulty in micturition.

On admission he was acutely ill, very restless, and complained of severe headache. His temperature was 102.4°; urine showed a trace of albumin; white blood count showed 17,000 cells with 73 per cent polymorphonuclear leucocytes. There were inequality and irregularity of pupils, but they reacted to light and on convergence; nystagmus was present in both planes; there was a right facial weakness of the central type; deep reflexes of both arms were diminished; knee and ankle jerks absent; there were a marked neck rigidity and a bilateral Kernig. Lumbar puncture showed a blood-stained spinal fluid.

He was discharged recovered twenty-two days after the onset of his illness. Three days later, while on his way to a resort in New Jersey, he had a seizure on the ferryboat and died before the boat reached the Jersey shore. No autopsy was done.

Case 3—A forty-eight-year-old tailor, well up to four days before admission, suddenly became dizzy and had a severe headache. After taking some bromo-seltzer he promptly vomited. His headaches persisted and he began to have diplopia and perspired freely.

Physical examination showed an acutely ill patient, very restless, and complaining bitterly of severe headache. His white blood count was 14,500, with 73 per cent polymorphous cells. There was percussion tenderness over the entire skull; both discs were blurred; the veins were engorged, but there was no measurable elevation; left pupil larger than right; both pupils irregular but reacted promptly to light and on convergence; there was weakness of both external recti muscles; slight right facial weakness of the central type; right deep reflexes were more active than the left; and right abdominal reflexes were diminished; plantar responses were equivocal; there was a marked neck rigidity and bilateral Kernig. Lumbar puncture yielded 30 c.c. of bloody spinal fluid under increased pressure. Later he developed a frank papilledema with hemorrhages, which ultimately cleared up. Repeated lumbar punctures up to three weeks showed evidences of bleeding into the subarachnoid space.

Case 4 was a fifty-year-old housekeeper, admitted to the hospital with the history of a sudden attack of unconsciousness the day before, followed by severe headache, persistent vomiting, and semi-stupor. Her left eye was "injured" forty years ago, following which she had "weak eyes." She was also said to have had occasional headaches for the past six months. On admission she was acutely ill, extremely restless, and vomited persistently. The tongue was dry and coated, and breath foul. Temperature and blood pressure

were normal; but the urine showed albumin and a few hyaline and granular casts. She had a widely dilated fixed left pupil and a sluggish contracted right pupil. The question of the old trauma to the left eye had to be considered as a possible cause of the immobility of the left pupil; both discs showed mild arteriosclerotic changes; the eye movements were slightly restricted in both lateral planes; the deep reflexes were barely elicited in both the upper and the lower extremities; the abdominal reflexes were absent; the plantar responses were equivocal on both sides; the neck showed marked rigidity; lumbar puncture yielded a uniformly bloody fluid under increased pressure. She developed fever during the second week of illness and a moderate left ptosis. Repeated lumbar punctures all showed evidence of the subarachnoid hemorrhage.

Case 5—A forty-year-old Polish tailor, complained on admission of severe occipital headache and vomiting of three days' duration. Four and a half years previously he had a sudden loss of consciousness, following which he remained in bed for two weeks. His present illness began three days ago with severe headache, vomiting which is profuse and not related to taking food, vertigo, stiffness of the neck, dulled mentality, trembling of the hands, and general weakness. Examination showed an acutely ill patient, semistuporous, noncoöperative. His temperature was 100° and pulse 60. Neurologically he showed unequal pupils, both, however, reacting to light and on accommodation; his fundi were normal; there was a slight weakness of both external recti muscles; he showed a slight right facial weakness of the central type; the deep reflexes were slightly more active on the right side; there was marked rigidity of the neck with a bilateral Kernig. Lumbar puncture yielded 18 c.c. of bloody spinal fluid under moderately increased pressure.

Two days after admission he had a generalized convulsion, which was described as a tonic fit, in which the patient's extremities assumed a decerebate posture. Later that day he had another, and the next day he had two more similar seizures. Following these seizures he showed marked disturbance in his cerebellar functions. Vestibular tests, according to the otologist, pointed to an intracerebellar lesion. Six weeks after the onset of his illness red blood cells were still present in his spinal fluid.

The clinical course showed steady improvement until his discharge from the hospital about two months after the onset of his illness. Two months later he reëntered the hospital complaining of headache, vertigo, staggering gait, and weakness of both legs. Examination at this time showed inequality of pupils, papilledema, a left homonomous hemianopsia, astereognosis, and disturbance of postural sensibility on the left side, and mild pyramidal tract signs on the left side. With these findings the diagnosis of a cerebral neoplasm was made. His spinal fluid at this time was clear, and showed 24 cells. He died about two weeks after his second admission and a cerebral neoplasm was found in the occipito-temporal lobe with considerable softening on the inferior surface.

On the basis of a number of parallel cases quoted from the litera-

ture that on autopsy showed a rupture of an intracranial aneurysm, the readers of the paper felt that they could best explain the clinical syndrome presented by the first four of their five cases on the assumption that they were dealing with a hemorrhage into the subarachnoid space from a ruptured intracranial aneurysm.

Discussion: Dr. D. Arbuse (by invitation) said: I have examined three of the cases reported, and curiously enough, one of the cases we reported as a complete cure I learned only yesterday had died. I went to the patient's home, and tried to find out how the patient met death, but the family had moved, and a neighbor told me she had heard death was due to an accident.

I saw the woman, G. S., aged forty-nine, on December 5, 1925, and at that time she merely complained of occipital headaches, and told me she had lost fifteen pounds in weight. Her physical examination was practically negative. Her fundi were negative; she had no signs of meningeal irritation. She had complained of persistent stiffness of the neck while in the hospital. Sensory examination was negative. All deep reflexes were present, but not active. When she came into the hospital all her deep reflexes were absent.

The other woman reported complains at present of headache in the left frontal region and dizziness. The positive neurological findings are as follows: She has a ptosis of the left eyelid, and an inequality of the pupils, the left being larger than the right. The left is fixed to light. The fundi are negative except for moderate angiosclerosis. She has no signs of meningeal irritation and no loss of motor power. She has no pathological reflexes; her mental status is good.

The man, A. S., is practically negative; all his reflexes are present; the fundi are negative.

Dr. E. D. Friedman said: The reference which Dr. Grossman made to the paper by Symonds is very timely. He has stressed this association of subarachnoid bleeding with the picture of acute meningitis. He has made it possible to diagnosticate a great many of these cases *intra vitam.* In one of the cases presented by Dr. Grossman there was present a sign which Symonds described as giving additional evidence of subarachnoid bleeding, namely, hemorrhage in the fundus. While the ophthalmologist attributed these to another cause, we felt that they constituted further evidence of bleeding into the subarachnoid space, with extension of the hemorrhage into the sheath of the optic nerve. I am told by an ophthalmologist that this is possible. One must agree with Dr. Grossman that the cases presented, except the last, which proved to be neoplastic, belong in this group of subarachnoid hemorrhage.

Dr. Simon Rothenberg said: We see these cases when it is difficult to differentiate them from encephalitis or brain tumor. We have a patient at the hospital at the present time who has given us great difficulty in diagnosis, in whom a hemorrhagic spinal fluid without eye symptoms or papilledema is present. This man presents a multiplicity of symptoms which makes it very difficult to localize the lesion. Whether it is an encephalitis or not is still a mooted ques-

tion. The point we have always stressed as being in favor of encephalitis has been the fact of acute onset with multiplicity of symptoms and the evidence of blood in spinal fluid. And yet, this case is indeed a difficult one to diagnose as such, because it is just as likely to be a hemorrhagic condition associated with aneurysm as an encephalitis.

Dr. I. Strauss said: I think for the purposes of the record it would be well to correct Dr. Friedman's explanation of subarachnoid hemorrhage going through the optic sheath.

Dr. Friedman said: I have already mentioned a case in a previous discussion of the subject before this Society, when Dr. Sands presented his paper several months ago; but I should like to make reference again to this case in which I was able to make a correct clinical diagnosis. A patient was admitted to the hospital in stupor. There were evidences of subarachnoid bleeding, fever, meningeal phenomena, and at the same time widespread hemorrhages in both fundi. Because of the coincidence of the meningitis syndrome, subarachnoid bleeding and the retinal hemorrhages, we believed that we were dealing with a perforating cerebral aneurysm. The post-mortem examination revealed a rupture of the posterior communicating artery.

Dr. Grossman added a word about the hemorrhage into the retina in these conditions. I was able to find only two references substantiated by post-morten examinations; one was the case reported by Simmons, who showed that the hemorrhage had passed forward in the sheath of the optic nerves, which were much distended with blood clot and ultimately tore its way forward underneath the retina. The second was a case comparable to the one cited above and was reported by Bramwell.

METASTATIC (SECONDARY) BRAIN TUMOR

Dr. J. H. Globus and Dr. H. Salinsky
(by invitation)

A survey of the clinical records and of the post-mortem findings in a group of fourteen cases of metastatic (secondary) tumor of the brain was presented. It was pointed out that only in a few instances was the neoplastic character of the disease process recognized during life, and still less frequently was the metastatic nature of the lesion suspected. It was suggested that one of the main diagnostic difficulties was found in the fact that in a large number of instances the primary malignant focus could not be detected and often was not even suspected. The conclusions drawn from the study of the fourteen cases were as follows:

Metastatic brain tumors are clinically characterized by:

1. An acute and often by a precipitate onset of cerebral manifestations; the latter are most commonly disjointed or disseminated in character, simulating a meningo-encephalitic process.

2. The symptoms of increased intracranial pressure, such as headache, nausea, vomiting, and dizziness, are usually out of proportion to the rather mild objective neurological findings.

3. Papilledema is not a common finding; it then occurs only when a tumor mass is present in a situation where it can obstruct the escape of cerebrospinal fluid from the lateral ventricles.

4. Meningeal signs are not infrequent and pleocytosis is occasionally found as the result of direct invasion by tumor tissue of the subarachnoid space or subependymal structures.

5. Psychosis in this series of cases was a terminal event and cannot be regarded as a diagnostic feature.

Discussion: Dr. G. H. Hyslop said: In 1924, in *L'Encephale,* fourteen cases of metastatic brain neoplasms were reported, and the clinical and pathological observations were quite similar to those this evening. I have had the pleasure of seeing approximately a dozen similar cases at the Memorial Hospital, where malignancy had been proven. I mention these because of the fact that the presenters of this evening's paper stress that the period between the diagnosis of malignancy following primary operation and the onset of intracranial symptoms leads one away from the belief that a malignant tumor in the brain may be present. The longest interval I recall was fifteen years, in a woman with a breast carcinoma, and the clinical course of her intracranial metastases was characterized, as has been brought out to-night. One thing might be added, and this is the frequency with which one finds one large metastasis producing the focal major clinical symptomatology. The brain at autopsy may be riddled with metastases, and the numerous metastases perhaps account for the intracranial pressure symptoms without much in the way of signs. A French author found quite frequently a marked ependymitis with a certain amount of degeneration of the myelin tissue in the region of the metastases, which he held to be responsible for a meningeal reaction, which would explain the headache, vomiting, and lymphocytosis.

Dr. I. Abrahamson said: This is a very important subject, and is worthy of much discussion. It is interesting that these cases showed a multiplicity of signs, and then seem to have only one large neoplasm. I personally feel that the brain must be riddled in these cases with minute foci of disease, because the clinical syndromes cannot be explained by a single tumor in most of these cases, and yet a single large tumor has been found. In one case mentioned by Dr. Globus, which six years later he reinvestigated, the patient presented a multiplicity of signs and symptoms, for at the time there was a discussion as to whether we were dealing with neoplasms or with an encephalitis. She had a pigmented mole on the leg which had been irritated by a garter. It became infected, and had to be removed. A year or two later a gland was removed from the groin, and the pathological diagnosis at the time was melanocarcinoma. At the time I sought to explain this gland as possibly a lymphadenitis with melanin deposit in it from the infected mole below, and that the brain process was not due to a malignant tumor; but that this tumor was really a lymphadenitis loaded with melanin which had been deposited there from the infected pigmented mole. At the time I reasoned by analogy that if you transplant a negro skin on a white man, within a short time all the melanin is within the neighboring lymphatic glands. The

skin becomes white, and we know that the melanin from an infected gland is carried to the nearest lymphatic, and that was my explanation of the tumor then. I do not believe that this one large mass explained all the signs and symptoms that the patient presented. That is characteristic of these tumors. Metastatic tumors affecting the spinal column are multiple. They may present in the early days symptoms possibly in the cervical distribution, radiating pains, evidence of radiculitis, etc., and we suspect with a history of malignancy before that we are dealing with a malignant tumor. The symptoms may disappear from the cervical region and finally settle in another site, remain persistent, and then a mass appears indicative of extensive destruction of the body of the vertebra. The x-ray in these cases is very apt to be negative in 50 per cent of the cases until very extensive destruction of bone has taken place, so at autopsy one frequently finds the entire column riddled with malignant tumors. At the Montefiore Hospital this has been explained that a secondary inflammatory process takes place about the neoplasm and localizes it and limits its spread. I think the syndrome that has been pictured of the very rapid onset and the stormy course is a syndrome we ought always to keep in mind, because it will be of great assistance in diagnosing these conditions and guiding our efforts at therapy.

Dr. Louis Aronson said: I would like to add another clinical condition for completeness' sake. The presence of brain neoplasm with a fairly positive diagnosis and also quiescent signs of neoplasm elsewhere for quite a long time, unsuspected, and then sudden blooming out of many clinical signs of general carcinomatosis.

A woman of thirty-eight on her way home from the mountains last September was suddenly taken with an attack of right-sided hemiplegia. She was irrational and aphasic, and was taken to the nearest local hospital. In the absence of lues and cardiac disease, the diagnosis most likely was that of a vascular condition. Months later she showed very mild haziness of the discs. A cerebral neoplasm was suspected and diagnosed. Nothing was found elsewhere. Gradually she lost weight and came down from 180 to 100 pounds. I saw her about four days ago, and she now presents at least three masses in the abdomen, one under the liver, one enormous mass in the left side, and one posteriorly connected with the ribs on the left side.

I mention this case because of the clinical rarity of intracranial symptoms, followed by a period of quiescence, and then a blooming up of a general carcinomatosis in the abdomen, the intracranial symptoms having made but little progress.

Dr. Globus said: I would like to stress one more point and that is that x-ray examinations of the skull do not yield any important information for the reason that a tumor with metastases to the brain will seldom metastasize into the bony tissues. On the other hand, tumors which frequently metastasize into the bony tissue do not metastasize into the brain. That is a very frequent occurrence in our autopsy material. We find very frequently a metastatic tumor in the scalp or calvarium but the brain remaining free of any tumor invasion. In the fourteen cases presented, in no instance was there a metastatic nodule in the bony structure.

PATHOLOGICAL MATERIAL. THREE CASES OF PRIMARY BRAIN NEOPLASM

Dr. I. Strauss and Dr. J. H. Globus

The first patient was a woman thirty-three years old. Four months before entering the hospital she had given birth to a child. She became pregnant because she had been told that pregnancy would relieve her of her deafness. She died, leaving another child in the world to care for. Her history dates back only two years. In these two years she had a diminution of hearing in the left ear, and there was also some staggering of the gait. This was thought to be due to a diminution of vision, and that she accommodated her gait more or less to the defect in vision which developed. The staggering gait came on very gradually; it was of a zigzag form. She had a tendency to fall to one side more than the other. She complained of pain in the region of the right trigeminal, and her only reason for entering the hospital was to be relieved of this pain in that region. The pain was typical of a trigeminal neuralgia, very acute, and she suffered very much from it. She had no convulsions and no ataxia of the extremities. She had not suffered from headache nor vomiting.

Physical examination at the time she entered the hospital showed she was deaf in both ears; that her vision was reduced to a concentric limitation of the field, a very marked limitation. Her fundi showed post-neuritic atrophy, with some congestion of the vessels, and a little blurring. She had a little facial asymmetry; a marked diminution of sensibility in the region of the left trigeminal, and a possible slight weakness in one side of the body. It was remarkable that there was such a paucity of physical signs. Here is a woman complaining of deafness, diminution of vision, without the history of headache and vomiting, with objective signs in the trigeminal region and a nystagmus not of great intensity. She continued under observation without much change. Examination by the otologists showed that the vestibular apparatus of both ears was affected. The conduction was lost. An examination by x-ray showed she had decided intracranial pressure. In order to be positive that we were dealing with a lesion of the posterior fossa (for remember she had no cerebellar symptoms outside of the change in gait), we did a ventricular puncture, and that bore out the diagnosis of posterior fossa lesion, because it showed a definite internal hydrocephalus. She was operated upon, stood the first stage well, and died on the table suddenly while the second stage was being performed.

It is interesting in looking over the literature, because you will see this woman has two tumors in the posterior fossa, one of tremendous size with marked deformation of the pons. It is interesting to see that occasionally there has been bilateral deafness with a tumor on one side. It is also interesting that Cushing had a case in which likewise there were so few symptoms pointing toward the internal hydrocephalus that the doctor wrote him he could not understand how

this patient could have a bilateral tumor with so few symptoms. The case presented to-night is one of that sort. It was diagnosed that she had a tumor in one angle. We were not certain, although some of us suspected the presence of a tumor in the other. There was one symptom which showed we were dealing with a large tumor: the vertical nystagmus, and toward the end of the illness, the loss of associated visual movement of the eye. These two symptoms point to an involvement of the brain stem. When the specimen is seen, it is surprising to think that this woman could have gone on for two years, and probably the tumors existed before then, without any history of tinnitus, headache, vomiting, cranial nerve symptoms outside of the last few months, when the irritation symptoms of the trigeminal region were present, and yet there could be the enormous distortion of the pons by a tumor of enormous size.

Dr. Globus demonstrated the pathological material and slides; the history of the second case was given by Dr. Grossman above.

Discussion: Dr. Globus said: Metastatic carcinomata of the brain frequently present a clinical picture which is difficult to differentiate from one presented by spongioblastomata, the primary malignant tumors of the brain. This is very likely due to the character of spongioblastomata, a form of brain tumor which may simulate almost any form of cerebral lesion, including metastatic brain tumor.

Current Literature

I. VEGETATIVE NEUROLOGY.

1. VEGETATIVE NERVOUS SYSTEM.

Serra, G. Neurotization of Muscle. [Chir. degli Organi di Movimento, March, 1924. J. A. M. A.]

Serra did not find evidence of regeneration, such as others have reported, although the function of the muscles was restored in all but two of the twenty-two rabbits. They were under observation for periods up to 136 days. The entire external popliteal nerve or merely half of it was switched to the gastrocnemius muscle, restoring physiologic conditions so far as electric tests, myograms and preparations of the muscle and nerve were concerned, but the muscle always looked different from its sound mate in color, size, consistency and weight. The results were equally favorable when he used an autograft of nerve or a homogenous graft as a free implant to bridge the gap between the nerve and the muscle. This technic enlarges the sphere of the method of direct neurotization of a paralyzed muscle or of two muscles.

Mills, H. P., Haines, T. H., and Sessions, M. A. Familial Muscular Dystrophy; Six Cases in One Family. [Am. Arch. Neur. & Psych., Vol. 10, Jan. J. A. M. A.]

Of the twelve persons in the family studied by the authors, five males and two females exhibited progressive muscular dystrophies, being in the order of birth, the second, third, eighth, ninth, tenth, eleventh and twelfth child. The oldest girl affected was the only pseudohypertrophic type among the six cases examined. Apparently a brother who died had a case of primary atrophy. The basal metabolism determinations of these six cases do not point clearly to either hyperfunction of the thyroid gland as the etiologic factors of muscular dystrophy. The findings in the cases studied varied from minus 22 per cent, to plus 10 per cent.

Nothmann, F. M., and Hirsh-Kauffmann, H. Triple Motor Innervation of Striped Muscles. [Klin. Wchnschr., I, 1820; Med. Sc.]

The present paper contains an analytical discussion of previous work by other investigators and a brief description of various experiments carried out by the authors. Their opinion on the subject is summarized in the following conclusion: the term "autonomic" should be used to indicate nerve-fibers ending in characteristic small rings, loops, and plates

in striped muscle-fibers or other terminal stations. The end-rings and plates may be either independent of or connected with a motor end organ. The term "parasympathetic" should be used to indicate nerve-fibers which are connected with muscular or glandular cells by means of a "cholinophil" receiving apparatus or receptive substance. The existence of an intermediate station, represented by a peripheral ganglion cell sensitive to nicotine, is not necessary to the function of parasympathetic fibers. In striped muscles this function prompts the so-called tonic contraction and possibly other tonic phenomena such as postural activity and plastic rigidity. (C. da Fano.)

Benedek, L., and Goldenberg, P. Huntington and Migraine. [D. Ztschr. f. Nervhlk., LXXVIII, Nos. 1, 2.]

Report of a familial combination of the two diseases.

Worster-Drought, C. Herpes Zoster with Localized Muscular Paralysis. [Brit. Med. Jl., June 9, 1923.]

This is a case report of an attack of herpes zoster affecting the area of the twelfth thoracic nerve. Twelve days after the appearance of the eruption paralysis of the muscles in the lower part of the abdominal wall of the same side appeared.

Gordon, A. Myotonia. [International Clinics, October, 1923.]

Myotonia presents several varieties with regard to individual characteristics of the tonic spasm, to its distribution and to the mode of onset. It may be congenital. It may be symptomatic in association with other diseases of the nervous system. It may be associated with muscular atrophy or myasthenia gravis. The chief characteristics of the affection consist of muscular contraction and fixation upon an attempt to execute some movements. The muscular contraction is more or less prolonged, and the relaxation of the muscles is gradual. Any change in the character or in the rhythm of a voluntary movement leads to myotonic contraction. The mechanical and electrical excitabilities present special features. The well known Erb's formula is typical of the disease. The wave-like muscular movements from the cathode to the anode; the exhaustion of the myotonic reaction on the repeated stimulation are quite characteristic of the disease.

The author reports an unusual variety of myotonia which he calls paramyotonia. In the latter there are several chief abnormalities. One is that the muscular spasm is brought on not by voluntary movements like in myotonia but by exposure to cold. Another feature is that the muscular tonicity lasts a long time. The Erb's formula may not be present. The present case is interesting from several points of view. While it belongs to the group of myotonia inasmuch as the muscular spasm is essentially tonic in character, the contractions are only intermittent, the onset is sudden and the mechanical irritability of the affected

muscles is increased. Nevertheless it differs from the classical myotonia in that Erb's myotonic reaction is absent, and that the muscular relaxation after an attack is rapid instead of being slow. Another point of interest lies in the localization of the affection. The muscles of the eyes have been only exceptionally found involved and almost always in association with other gross muscles of the body. In the present case only the muscles surrounding the orbital cavities were affected. The case is apparently unique from this viewpoint. The author enters into a discussion of the pathogenesis of the disease. He considers the problem of an inherited abnormality of muscular structure and function. He recalls Schiefferdecker's suggestion with regard to a special disorder of the sarcoplasm and of the muscle fibers. In this connection he calls attention to Hunt's view concerning two systems of motility, namely, the kinetic and static, also that the kinesthetic system is the sensory component underlying the twitch and the contractile tones. The author further considers Westphal's view, namely, that in myotonia there is a congenital anomaly of muscular tonicity. He also reminds one of the possibility of a congenital lesion of the motor tract, of a primary myopathy or of a systemic affection of the muscles depending upon the nervous system. (Author's abstract.)

Schlesinger, H. Intermittent Lameness. [Deut. Ztschr. f. Nervhlk., LXXVII, Nos. 1–6.]

The author mentions as factors to be considered etiologically beside nicotin abuse the effect of severe but nonperforating injuries and syphilis while strenuous physical effort is a precipitating cause. Fibrillary twitching in the small muscles of the foot is an accompanying symptom little considered. Observation confirmed cerebral influence for it was found that after ether narcosis in one patient the disturbance in walking disappeared for some time and also that after cerebral paralysis the symptoms may completely disappear.

Langelaan, J. W. On Muscle Tonus. De Boer's Experiment on the Frog. [Brain, XLV, Parts 3 and 4, p. 434.]

This experiment consists in cutting the rami communicantes which unite the sympathetic chain with the spinal nerves of the lumbar plexus. The animal is then suspended so that the difference in the position and length of the two hind legs can be observed. According to de Boer the leg on the side on which the rami communicantes are cut is invariably more extended and slightly longer than that of the normal side, and he attributes this difference to a loss of tonus of the muscles of this limb.

In the first group of experiments here reported, the seventh, eighth, and ninth rami communicantes were divided on the right side, the spinal cord being left intact. This operation was followed by local shock of the primary reflex arcs of the spinal cord, during which the loss of tonus was complete. As the shock passed off the loss of tonus became only par-

tial. As a result of the section of the rami communicantes, the muscles lost a great deal of their plasticity. The diminution of the plasticity of the muscles showed itself most distinctly in the attitude of the frogs, but the movements also lacked steadiness. The results of diminution of plasticity were gradually compensated by stimuli emanating from the labyrinths, especially from the labyrinth opposite the side on which the rami communicantes were divided.

In the second group of experiments, the seventh, eighth, and ninth posterior roots were divided on the right side, the spinal cord being left intact. This operation was likewise followed by local shock of the primary reflex arcs of the spinal cord, during which the loss of tonus was complete. When the shock passed off a diminution of the tonus remained. The posture and movements of the animal were approximately normal, so that the diminution of tonus seemed chiefly, though not exclusively, due to a decrease of contractile tonus. The rotatory reflex was not permanently influenced by section of the posterior roots.

The third group of experiments was made on frogs in which the spinal cord had been divided between the second and third spinal roots. This operation was followed by severe shock in the distal part of the body, during which there was complete loss of tonus. When the shock passed off a diminution of tonus remained. Subsequent section of the seventh, eighth, and ninth rami communicantes produced a diminution of the plasticity of the muscles of the hind limb. After section of the spinal cord, the rotatory reflex was abolished.

In the fourth group of experiments, incomplete section of the spinal cord was made between the second and third spinal roots. In these animals, the rotatory reflex, though feeble, could still be elicited if the external part of the anterolateral tract and the zona marginalis were only left intact. If the corpus restiforme was injured, the rotatory reflex emanating from the labyrinth on the affected side was abolished. The fibers conducting tonic impulses from the labyrinth to the muscles pass by way of the corpus restiforme; a certain part of the fibers subserving the rotatory reflex enters the tractus anterolateralis of the spinal cord.

Schütz, H. Changes in the Striated Muscles in Morbus Basedow. [Ziegler's Beitrg. z. path. Anat. u. z. allg. Path., LXXI, No. 2.]

Schütz has found degenerative processes in the striated muscles, especially in the eye muscles, with substitution by fatty or more rarely connective tissue. He finds also small foci with lymphoid cells, analogous to the formations found more frequently in the thyroid in Basedow's disease but also in the muscles in myasthenia. It may be that exophthalmus is due to these processes. Especially in cases of this which are chronic and incurable there can be found a more or less marked growth of fatty and connective tissue and of the vascular tissue.

Hammett, F. S. Creatinin and Creatin in Muscle Extracts. V. Comparison of Rate of Creatinin Formation from Creatin in Extracts of Brain and Muscle Tissue. [Jl. Biol. Chem., March, 1924; J. A. M. A.]

Data are presented by Hammett which show that the rate of creatin transformation into creatinin is practically the same in extracts of brain tissue as in extracts of muscle tissue, when the two extracts are obtained from tissues from the same animal. It is, therefore, concluded that creatinin formation is not a process essentially confined to muscle tissue, but is a property of brain tissue as well. The findings are experimental support for the hypothesis of Folin that creatinin formation is a property of the total normal tissue metabolism.

Weiss, S., and Kennedy, F. Clinical Experiments in Myotonia Congenita (Thomsen); Parasympathic Nervous System. [Am. Arch. Neur. & Psych., Vol. 10. J. A. M. A.]

The observations reported by Weiss and Kennedy afford no evidence that the disease is primarily of muscular origin, but they point toward the fact that it is due to an abnormally increased activity of the parasympathetic nervous system which normally regulates the tone of striated muscles. The administration of thyroid substance and thyroxin exerted the same sensitizing action on the effect of atropin in this case that they exert on the effect of epinephrin in normal individuals. This suggests that the thyroid secretion is a sensitizing agent for both the sympathetic and the parasympathetic systems.

Foix, Ch., and Nicolesco, I. Changes in the Nervous System in a Case of Thomsen's Disease. [Compt. Rend. Soc. de Biol., LXXXIX, p. 1095.]

In this case there were, in addition to the classical muscular changes of Thomsen's disease, others which affected the cells of various parts of the central nervous system. These nervous lesions affected: (1) the corpus striatum, especially the lenticular nucleus; (2) the infundibulo-hypothalamic formations and the substantia innominata of Reichert; (3) the black-pigmented cell groups of the bulbopontopeduncular axis which seems to comprise partly the formations of the extrapyramidal path and partly the vegetative formations of the neuraxis; and (4) the vesicular cells, substantia reticulata, and the dentate nuclei of the cerebellum. The large cells of the putamen are moderately atrophied and show a special kind of brown pigmentary degeneration: its smaller cells show a slighter degree of the same changes. The cells of the globus pallidus are for the most part atrophied; many are transformed into hyperchromic balls; some cells show an increase of lipochrome; others contain granules of black pigment; there is also a progressive neuroglial reaction. The cells of the substantia innominata of Reichert and the nuclei of the tuber

cinereum (especially the periventricular nucleus) show atrophic lesions with great abundance of lipochrome and frequently a multivacuolar appearance of the protoplasm. The groups of black-pigmented cells of the locus ceruleus show three stages: (1) enormous swelling of the nucleus with reduction of protoplasm, (2) atrophy of the cell which is reduced to a mass of pigment, and (3) destruction of the cell and liberation of its pigment. Similar changes are present in the dorsal vagus nucleus, but without swelling of nuclei; there is often vacuolization of their protoplasm. The locus niger shows only discrete lesions with exodus of pigment. Similar changes are found in the darkly pigmented cells of the bulbopontopeduncular reticular formation; these are in striking contrast with the absolutely normal condition of the motor nuclei (hypoglossal, ambiguus, facialis, masticator, etc.). The nonpigmented nerve cells of the bulbar reticular formation and the paramedian groups of reticular cells of the pons show central chromatolysis with lipochromic excess, and for the most part atrophy. The vesicular cells are notably atrophic, and so also are a certain number of the cells of the cerebellar dentate nuclei, and the darkly pigmented cells of the reticular formation of the upper cervical spinal cord show the same changes as those seen in the cerebral pigmented cell-groups. In all the altered regions there is a certain degree of progressive neuroglial reaction. The changes found in this case are of the abiotrophic type; their distribution is not haphazard, but is seen in the formations of the extrapyramidal path and of those cell-groups which we connect with the vegetative system. They differ in certain points from the lesions found in cases of the Parkinsonian syndrome. Somewhat similar, but not identical, changes in the nervous system have been met with by the writers in two cases of myopathy. [Leonard J. Kidd, London, Eng.]

Funsten. Clinical Study of Thirty Cases of Muscular Dystrophy. [Jour. Bone and Joint Surg., V, 190.]

This paper reports an analysis of 30 cases, 4 of which were of the juvenile form, coming on at the ages of twelve, fifteen, eighteen and twenty-one years, and usually starting as the upper girdle type. The other 26 were of the infantile form, and more frequently started as the girdle type, the weakness being noted in the lower limbs, with difficulty in getting up from the floor, and in going upstairs. Stumbling, lordosis, waddling gait and the loss of reflexes were the characteristic symptoms. Twenty-four of these were of the infantile type, either the hypertrophic or the atrophic forms. There were two cases of the fascioscapulohumeral type. Seven cases were beyond the walking stage and had various contractures. Twelve cases were treated for from four weeks to three months with various glandular extracts without any appreciable effect. Seven cases were treated with calcium lactate and 11 with massage and exercises with or without glandular treatment. It is felt

that the calcium lactate was of some benefit. Wassermann tests were made in 14 cases and were negative. The microscopical blood picture was normal in the six cases examined. The reflexes were either absent or greatly diminished in all cases, with the exception of the cremasteric and abdominal reflexes, which as a rule were present. Microscopical examination of the muscle made in four cases showed the fibers to be pale, with diffuse areas of granular degeneration and vacuolization. There were also areas of infiltration between the muscle fibers. The striations were present, except in a few places where complete degeneration had taken place. Of this series of 30 cases 23 patients are known to be living, 3 are dead from intercurrent diseases, and 4 have not been recently heard from. In none of these cases was there any tangible connection between the onset of the disease and acute infectious diseases. In no case was the onset acute.

Heyman, C. H. Bone Atrophy and Sympathectomy. [J. A. M. A., Vol. 83, April 26, p. 1333.]

This study suggests that in any neurological or inflammatory conditions in which bone atrophy develops there is a disturbance of circulation, manifested by either trophic or inflammatory changes; and that in cases where this atrophy occurs—such as fractures and conditions for which plaster immobilization is employed—the cause of it is the less active blood supply in the bones and soft parts due to the discontinuance of active movements. He reports in detail the case of a man who had an accident to his left foot, which resulted in a lacerated wound without fracture, but with much swelling and pain. Five months later he was still unable to bear any weight on the foot owing to the extreme pain thus caused; the pain was present at all times and was particularly severe during the night. The arterial pulses in the foot were scarcely perceptible and there was marked general tenderness. X-ray examination showed considerable atrophy of the bone. Sympathectomy of the femoral artery was performed, and within three minutes there was a good pulse in the foot, the pain ceased almost immediately, and a week later the patient could bear considerable weight on the foot. Two months after operation he was able to return to full work. Heyman suggests that, although the condition of the bone could not have been relieved in so short a time as this, yet trophic disturbances may play an important part in this condition and be responsible for many of the symptoms.

Engelbach, Wm., and McMahon, Alphonse. Osseous Development in Endocrine Disorders. [Endocrinology, Vol. 8, January.]

Variations in the classical types of different ductless gland disorders prompted the writers to make X-ray studies of the development of the osseous system in endocrines. These studies consisted of comparing the osseous development, as determined by the X-ray, of various endocrines with the normals for the same ages. In order to make these comparisons

it was first necessary to establish the appearance and union of the epiphyseal centers in the normal for each age. This was done by correlating the information obtained from anatomical and various X-ray studies made by Gray, Baetjer, Waters, Knox, and Rotch, compared with the X-ray studies made by the writers upon normals. The ages for the appearance and union of the epiphyses in normals were determined by the writers by X-ray studies of a series of normals, ranging from birth to twenty-five years of age. The developmental history of all the normals was obtained, and, where possible, a history of endocrine abnormality in the parents was elicited. The normals were then examined physically and compared with the various tables for normals as to height and weight, for age. Complete laboratory work, including serological tests, on normals and their parents, was then done. Following this, in those who were accepted as normals from these observations the various ossifying centers of the body were radiographed. Where any of the physical or radiographic signs suggested a marked departure from the predetermined normal for the age, the individual was rejected as not having a normal osseous development. By this method the normal appearance and union of the ossifying centers were determined, and the roentgenographic signs of the osseous system in normals were tabulated according to ages. A table indicating what joints and bones to X-ray for each age was evolved.

Comparisons of the radiographic pictures of the normals with the various endocrine deviations at every age are included in the original article. The cases selected are as follows: (I) Uniglandular: (1) *Hypothyroidism* (cretinism and infantile myxedema). (2) *Hypogonadism* and *eunuchoidism.* (3) *Hypopituitarism:* (a) Pure anterior lobe pituitary insufficiency, without posterior lobe disorder. (b) Bilobar pituitary insufficiency. (4) *Status thymicolymphaticus.* (5) *Pubertas precox* (suspect hyperpinealism). (II) Pluriglandular: (1) *Thyropituitary cases* (infantile hypothyroidism, to which later in life there is engrafted a hypopituitarism of one or both lobes of the hypophysis). (2) *Pituitary-thyroidism* (consisting of a primary hypopituitarism, to which at a later age a secondary hypothyroidism is added).

The general conclusions drawn from these studies are as follows: (1) In hypothyroidism there is a general retardation of the osseous development. This retardation is seen in all the centers and is not limited to the carpal bones. (2) The gonads must supply an internal secretion which has a marked influence in timing the closure of the epiphyseal lines, as evidenced by a delay in the fusion of the epiphyseal centers in all hypogonad states, either primary or secondary, and a markedly advanced or early closure of the epiphyseal lines in all hypergonads, such as pubertas precox (suspect hyperpinealism). (3) The anterior lobe of the pituitary gland furnishes a hormone for the growth of all the bones. This is strikingly demonstrated by the lack of osseous growth in insufficiency of the anterior lobe of the pituitary gland, in the presence of open

epiphyseal lines many years after they are closed in the normal. This produces in these individuals a very short, infantile stature, which can be shown to have open epiphyseal lines, due to a secondary hypogonadism, and in which there is no tendency to increase of bony growth, due to the absence of the anterior lobe pituitary hormone. (4) In cases of status thymicolymphaticus there is a general retardation of ossification, similar to that in the simple hypothyroidisms, in the first years of life. (5) In suspect hyperpinealism (pubertas precox) there is a marked advance in the osseous development, together with an early closure of the epiphyseal lines, producing an individual of short stature (due to this early fusion of the epiphyseal centers), which contrasts decidedly with the long stature with open epiphyseal lines in the eunuchoid and compares with the same size and stature with open epiphyseal lines in the anterior lobe pituitary deficiency. (6) In the pluriglandular disorders, having more than one gland decidedly involved, the studies demonstrated that in the thyro-pituitary insufficiencies there was an advance in the osseous development, while in the pituitary-thyroid deficiencies there was a retardation of the ossification. The osseous development in many more of these pluriglandular disorders must be carefully studied radiologically before definite conclusions can be drawn. [Author's abstract.]

II. SENSORI-MOTOR NEUROLOGY.

1. CRANIAL NERVES.

Adson, A. W., and Ott, W. O. Reservation of the Facial Nerve in the Radical Treatment of Parotid Tumors. [Arch. Surg., VI, 739–746.]

A complete removal of the parotid gland with the preservation of the facial nerve is indicated in certain cases of tumors of the parotid, especially those that have broken through the capsule or have recurred after local removal. In small encapsulated tumors this procedure is not usually indicated. In cases in which metastasis has taken place in the parotid gland, or cervical lymph glands, and involves the facial nerve, it is exceedingly difficult to preserve the nerve. Mixed tumors of the parotid constitute a small percentage of malignant tumors of the body; in 1,607 patients who were examined at the Mayo Clinic there was only one. The growth of these tumors is slow, and as long as they remain encapsulated they are not highly malignant, but when the capsule is ruptured through growth or incomplete operation in which the entire tumor is not removed, invasion of the surrounding tissue soon takes place, and the growth becomes highly malignant. According to Sistrunk a permanent cure is obtained in early cases by enucleation of the tumor in practically every instance. The importance of complete removal of the parotid gland is emphasized if there is a possibility of not

being able completely to enucleate the tumor, or if there is any evidence of an extension of the tumor into the parotid gland. Radium is of some value in the treatment of these tumors, but it does not compare with the efficacy of surgical treatment. The technic of the enucleation of small encapsulated tumors has been described by Sistrunk. We have found that it is possible to carry the dissection of the temporal and cervical portion of the seventh nerve through the parotid gland, and to dissect the nerve away from the gland. An incision two cm. below the lower body of the mandible running over the mastoid process is made, and the inframandibular branch of the seventh nerve is exposed. This is followed upward until the Y of the seventh nerve is exposed. A vertical incision is then made from just below the zygoma, passing down one cm. in front of the ear, and joining the first incision. Then the cervical and temporal divisions of the seventh nerve are dissected through the lower lobe of the parotid gland; the facial nerve penetrates the lower lobe of the parotid for a distance of only about two cm., and then lies underneath the parotid on the muscles of the face. The dissection is next carried forward sufficiently to elevate all of the parotid, and, when this is completed, Stenson's duct is ligated and divided, and the parotid gland removed from the skin. If the skin is involved, the area may be removed with the malignant mass. The deep lobe of the parotid, which lies posterior and mesiad to the ramus of the mandible, is removed by gently elevating the facial nerve outward and dissecting out the parotid gland which lies mesiad to it. The exposure obtained by the foregoing procedure facilitates complete removal of all parotid tissue with any involved skin that may be present, without severing or injuring the facial nerves. The facial nerve should be sacrificed only if metastasis and necrosis have become so extensive that it is impossible to demonstrate the lines of cleavage. [Author's abstract.]

Spalaikovitch. Psychoneuropathic Complications of Otitic Disease. [Rev. de Laryng., Otol. et Rhinol., April 15, 1924.]

The author describes two cases in which symptoms of intracranial mischief followed suppurative otitis media of some standing; in both cases a mastoid operation had been performed some time previously. The first patient was a girl who had had otorrhea for nineteen years, and a complete mastoid operation had been performed. Two months after the operation severe pain developed in the ear and the corresponding side of the head. Later she passed into semicoma, lay motionless in bed, and was only roused with difficulty. The ear was in good condition, there were no abnormalities in the nervous system, the temperature and pulse were normal, and her condition was diagnosed as psychoneuropathic. No amount of suggestion was of any avail, and eventually, under general anesthesia, a post-auricular incision was made, sutured, and an enormous dressing applied. The wound was elaborately dressed and

the sutures removed a few days later. The wound healed perfectly and the symptoms entirely disappeared, with no recurrence. The author contrasts this case with one in which a large cerebral abscess gave rise to no symptoms other than a moderate degree of coma, and was only diagnosed because there was a history of a previous similar abscess in the same patient on the same side. The first case was diagnosed by the lack of localizing symptoms, by the normal pulse and temperature, by the normal cerebrospinal fluid, and the discrepancy between the acute pain in the ear and the very healthy condition of that organ. The second case of simulated endocranial symptoms was a man of thirty-four who had had a mastoid operation seven years previously. His symptoms suggested labyrinthine irritation and included spontaneous nystagmus, a tendency to fall to the left and backwards, and some vertigo. Two months later he came back with much more pronounced symptoms of incoördination and ataxy, much deafness on the healthy side, considerable reduction of the visual fields of both eyes, and very severe headache. Discrepancies between the severity of the symptoms and the amount of pathological change discoverable gave rise to the diagnosis of psychoneurotic simulation. He was given spectacles with glasses of different colors, and found that he regained his stability best with green glasses. These he wore for about a fortnight, after which he left the hospital cured of his intracranial symptoms. Such pseudo-complications are somewhat more common in the female sex and occur more often during adolescence; the patients show other signs of neurosis in many cases. These symptoms would not arouse much interest if they did not arise in association with a suppurative aural lesion which lends a very considerable gravity to their interpretation. It is stated that hysteria never completely simulates the symptomatology of a given lesion, but in some of the cases described the similarity is very close. Careful examination reveals some discrepancy—for example, in cases of mastoid tenderness, when the attention has been strongly engaged, deep and forcible pressure on the mastoid evokes no attempts at resistance. The first rule in treatment is to obtain the confidence of the patient, and the second is to retain it.

Ferreri, G. Ear Tests in Serous Meningitis. [Riv. Oto-Neurol.-Opt., Vol. I, December. J. A. M. A.]

Ferreri noted in nine cases of essential serous meningitis that the response to tests revealed a dissociation between the anterior and the posterior labyrinth, and that the latter failed to respond to the usual stimuli. This hypoexcitability of the posterior labyrinth in three of the cases was total, with both cold and heat caloric tests, and the response to rotation and electric tests was sluggish. The intracranial pressure was high in all cases, with persisting headache. The anterior labyrinth gave normal responses throughout.

Scarlett, Hunter W. Some Neuro-Ophthalmic Studies of War Injuries. [Atlantic Med. Jl., September, 1923, p. 823.]

Subject is treated under the following headings:

(1) Manifest lesions of the cranium, involving the cerebrum.
(2) Cervical sympathetic nerve injuries.
(3) Injuries affecting the tissues of the globe and the cranial nerves, either directly or by contre-coup.
(4) So-called functional disturbances.

Under the first heading are included the different types of hemianopsia, resulting from head wounds, also the theories of Holmes, Lister, Morax and others, as to the cortical representation of the various areas of the retina. Special mention is made of the macula and the different opinions as to whether it has a unilateral or bilateral occipital enervation. From cases personally studied by the author, he inclines to the bilateral theory.

In the second group of injuries, the symptoms resulting from lesions to the cervical sympathetic nerve, include ptosis, myosis, enophthalmos, and narrowing of the palpebral fissure. Vasomotor disturbances are frequently present, especially if the cases are seen several months after the injury. Lesions of the brachial plexus roots cause the most pronounced symptoms, those higher up involving the sympathetic nerve produce less well marked symptoms, while contusions of the cord cause the least pronounced phenomena. The pupil dilates readily under cocaine in the cord contusions, but little or not at all in root and nerve lesions.

In the third classification are mentioned the affections of the tissues of the globe, nerves and soft tissues, such as choroidal tears, hole in the macula, and lesions of the optic and motor nerves, due to direct or indirect injuries of the orbit. The etiology of these injuries including gunshot wounds and change in the extraocular pressure from concussion, is discussed.

The fourth and last division includes functional disorders which are manifested by diminution of vision, contraction of the visual fields with interlacing of colors, and usually mydriasis. Often associated with these are spasm of accommodation, temporary blindness, scintillating scotoma, diplopia and erythropsia. Emotional and psychical factors underlie this condition, which is caused by high explosive shells producing a profound cerebral disturbance, without evidence of external injury. [Author's abstract.]

2. PERIPHERAL NERVES.

Condat. Herpes Zoster and Varicella. [Arch. d. Méd. d. Enf., Feb., 1923.]

Condat discusses the alleged proofs of identity of herpes zoster and varicella, and finds that they are far from convincing. She observed one case of herpes zoster which was followed by three cases of varicella in

the same family. An exact analysis, however, showed that the infection by varicella could be traced to contact with other children on different Sundays, while the zoster seemed to be just a coincidence. The child with herpes had had varicella before, and was therefore immune to it, but not to herpes.

Gersternberger, H. J. Etiology and Treatment of Herpetic Stomatitis and Herpes Labialis. [Am. Jl. Dis. of Child., Oct., 1923. J. A. M. A.]

Gersternberger found that the administration of the water soluble B vitamin produces in herpetic stomatitis, aphthous stomatitis, herpes labialis, acute gingivitis, and ulcerative stomatitis a remarkably rapid improvement and recovery. It is suggested that the primary etiologic factor in these cases is metabolic and nutritional, and that any rôle that bacteria or similar agents may play in the future development of the local lesions is secondary. This metabolic disturbance may be due to a disproportion between the water soluble B supply of the body and the metabolic requirements of the patient for this vitamin at a given time. The constant and liberal use of canned tomato is advocated as an economic and dependable source of the water soluble B vitamin.

Bloedorn, W. A., and Roberts, L. J. Herpes Zoster with Motor Paralysis. [Journal A. M. A., Vol. 83, Feb. 23.]

A history of a case of herpes zoster of the area of the skin supplied by fibers from the eleventh left thoracic nerve trunk. Two days after the eruption appeared the patient noticed what he suspected was a tumor in the left flank associated with hyperesthesia in this region. No mass could be palpated. The bulging become much less noticeable when he assumed a reclining position. On increasing the intra-abdominal pressure, the protrusion became more marked. The bulge was in the anterior axillary line and extended from the crest of the ilium to the umbilicus. In the region of this protrusion palpation demonstrated a marked flaccidity of the muscles. Physical examination otherwise revealed nothing worthy of note. The protrusion of the abdomnial wall was felt to be due to a paralysis of the abdominal muscles in this region, the posterior portions of the external oblique, the internal oblique, and the transversalis being involved. It was a case of herpes zoster complicated by involvement of the anterior nerve root. When the patient was last seen, five months later, the protrusion of the abdominal wall had nearly disappeared, although the muscles involved were still somewhat flaccid and a slight bulging could be detected on increase of the intra-abdominal pressure.

Lépine, J. Paralysis After Preventive Treatment of Tetanus. [Lyon Méd., June 20, 1924. J. A. M. A.]

Referring to two cases, Lépine emphasizes that paralysis consecutive to this treatment affects the nerves of the upper extremities, especially the

brachial plexus; mostly on the right side. In some cases the lower limbs were slightly affected. The clinical feature is a severe pain in the shoulder radiating along the arm, and in a few days incomplete paralysis, with loss of the tendon reflexes. Amyotrophia with partial degeneration is soon noted; fibrillary contractions were observed only in one case. The sphincters and the sight are intact. The lesion affects the nerve root; the nerve itself and the nerve centers are not touched. The disturbances seem to be more pronounced if associated with an anaphylactic reaction in subjects previously injected with the antiserum. But the nervous disturbance does not correspond to the intensity of the anaphylactic phenomena, and it may be assumed that it is caused by the tetanus toxin of the antiserum. The disturbances have persisted for a year or more in the experiences that have been published, even in cases with final recovery.

Stookey, Byron. Artificial Nerve Branches for Innervation of Paralyzed Muscles. [Archives of Surgery, Vol. VI, pp. 731–738.]

When muscular branches are destroyed and nerve suture is impossible, paralyzed muscle may be innervated by the formation of an artificial nerve branch. Stookey's experiments show that when one end of a free nerve transplant is sutured to the nerve trunk and the distal end is implanted directly into the muscle, the free nerve transplant may be made to serve as a conduction path from the nerve branch. An artificial nerve branch may be made for a muscle from a nerve trunk which normally supplies the muscle; or, if this nerve trunk is totally destroyed, a branch may be made from an adjacent nerve. Thus a muscle may be brought under the domain of a nerve which never supplies it normally; for example, the biceps may be supplied by an artificial branch from the musculocutaneous, or, if the musculotaneous is destroyed, it may be innervated by an artificial branch from the ulnar or median nerve. Evidence that paralyzed muscles may be neurotized by an artificial nerve branch was shown by electric stimulation of the artificial nerve branch, resulting in a rapid and quick contraction of the muscle which had been deprived of all other nerve supply, by the normal size and color of the muscle, and by the histologic findings which revealed normal striations of the muscle fibers and the presence of nerve branches and nerve fibers in the muscle thus innervated. [Author's abstract.]

Bignami, G. Changes Due to the Avulsion of the Sacro-Lumbar Roots in Chelonidae. [Boll. d. Soc. med. chir. di Pavia, XXXIV, 327. Med. Sc.]

Experiments were made in a number of specimens of *Testudo graeca* and *nemoralis*. When the sacro-lumbar roots of one side were avulsed quite close to the corresponding ganglia the nerve-cells of the anterior horn and ganglia showed chromatolytic changes similar to those described by previous authors in higher vertebrates. The changes only appeared

after longer periods of time, the nerve-cells of the spinal cord being affected first. When the same experiment was carried out on the sciatic nerve, hardly any lesion of the nerve-cells of the corresponding ganglia and portion of the spinal cord was noticed.

Sénèque, J. Mechanical Injury of Brachial Plexus. [Jl. d. Ch., Aug., 1923.]

Changes in the transverse process of the seventh cervical vertebra should be examined by X-ray in patients complaining of an apparent neuritis of the brachial plexus.

Proeschel, G. A Case of von Recklinghausen's Disease, with Spinal Cord Symptoms. [Ztschr. f. d. ges. Neurol. u. Psychiat., LXXXI, 127. Med. Sc.]

The patient was a girl of sixteen with a slowly progressive spastic paraplegia and wasting of the small muscles of the hands. Tender, freely movable subcutaneous tumors varying from the size of a lentil to that of an egg were found on the limbs and trunk. There was a marked dorsal kyphoscoliosis. Nothing is said of the mental state, or of pigmentation of the skin. Two extramedullary tumors were removed from the cervical and upper dorsal regions during life. After death tumors were found on peripheral nerves, in the cerebello-pontine angle, on the posterior roots, on the inner surface of the dura, and on the cauda equina; in the mid-dorsal region there was an intramedullary tumor about the size of a bean; multiple small tumors were found on the wall of the colon and on abdominal sympathetic fibers. All the tumors were pure neuromas as described by Verocay. So far as the author knows, this is the first case to be described in which, without involvement of the small cutaneous nerves, multiple nerve-fiber tumors have been found on peripheral nerves, on spinal and cerebral nerve-roots, on the meninges, in the cord itself, and on sympathetic fibers. In other cases of intramedullary tumor with neurofibromatosis the spinal tumor was a glioma or a fibroma.

Netter, A. Herpes Zoster and Chickenpox. [Paris Méd., Vol. 53, June 7.]

Netter has obtained positive fixation of complement using fluid from herpes zoster vesicles and serum from chickenpox patients, and *vice versa.* The connection between them, he reiterates, is as certain as between vaccinia and smallpox.

III. SYMBOLIC NEUROLOGY.

3. PSYCHOSES.

Recktenwald. Epilepsy-like Convulsive Attacks in the Course of Schizophrenia. [Zschr. f. d. ges. Neurol., Vol. LVIII.]

The author tests the validity of the generally accepted idea that dementia precox in itself is associated with so-called catatonic, that is

epileptiform attacks. Two of the four cases studied incidentally suffered one from dural endothelioma of the frontal brain and the other from brain arteriosclerosis. Only in one case did the convulsions appear to be directly due to the catatonia, *i.e.*, the schizophrenia, but in the other they were considered only as a schizophrenic-echopractic imitation of epileptic attacks belonging to a secondary disease.

Spaulding, Edith R. Endocrine Therapy in Combination with Mental Analysis. [American Journal of Psychiatry, Vol. 1, No. 3, January.]

This is a discussion of the correlation of psychotherapy and endocrine therapy based on the well known interdependence of the endocrine and vegetative and central nervous systems. Four cases are cited to demonstrate the value of endocrine therapy with mental analysis: (1) manic-depressive psychosis, (2) a psychopathic personality with episodic attacks, (3) psychoneurosis showing anti-social tendencies, and (4) a case showing emotional imbalance in a girl who had utilized physical conditions in which there was a glandular element to protect herself against unpleasant social situations. [Menninger.]

Frets, G. P., and Donkersloot, W. N. Senile dementia and Alzheimer's Disease. [Nederlandsch Tijdschr. voor Geneeskunde, LXVII, p. 21, 6 figs.]

The writers record a case illustrative of the relationship between Alzheimer's disease and senile dementia. A woman 68, was admitted with the diagnosis of senile dementia, and died after 3½ years' illness. For a year she had talked all day, did not know where she was, had restless nights, and was confused. On admission, was disoriented, often left her bed, stole the patients' things, and was irritable. No physical signs. Three years after the onset she began to have attacks of disturbance of consciousness of one or two days' duration: these increased in frequency. During these attacks she was very dull and stupid, did not respond to questions, was very somnolent, and had twitchings in limbs and face. Her dementia increased and speech became so impoverished that ultimately it was reduced to repetition of senseless sounds. She went down hill rapidly and became bed-ridden, lying constantly with legs strongly drawn up and back bent. She was supposed to have cerebral arteriosclerosis with small hemorrhages; and this, with the strong spasticity of the bent limbs, suggested a localization in the corpus striatum. Necropsy showed great atrophy of the brain, but there was no cerebral arteriosclerosis: there was early internal hemorrhagic pachymeningitis, and pulmonary tuberculosis, with slight arteriosclerosis of the coronary arteries. The history of the terminal apoplectiform attacks led to a miscroscopical examination. There were numerous senile plaques and fibril degenerations of the cells of the cerebral cortex in Bielschowski proportions; and in the putamen and the globus pallidus "Drusen" (Fischer) fibril degenerations were found. But microscopically the corpus striatum showed no

atrophy. On both sides in the frontal, temporal, and Rolandic lobes of the cortex very many "Drusen" and fibril degenerations were found. In the large cells of Betz of the lobus paracentralis and the gyrus centralis anterior only a few and not very definite fibril degenerations were found. There were similar changes in the nucleus caudatus, but less marked than in the cerebral cortex: the same was true of the putamen and globus pallidus: thus, in all the three nuclei of the corpus striatum fibril degenerations were found. The writers mention another case of Alzheimer's disease in a woman of fifty-seven. She had a progressive dementia, but without any speech disturbance or focal signs: this, occurring in the presenium, suggested Alzheimer's disease. Necropsy showed senile plaques and Alzheimer's fibril degeneration of the ganglion cells of the cerebral cortex especially the frontal lobe. In all three nuclei of the corpus striatum there were "Drusen" and fibril degenerations, but much less than in the writers' first case; and here they were much fewer in the globus pallidus than in the putamen and caudate nucleus; here, too, there was no macroscopical atrophy of the striatum. Fischer describes the condition of senile dementia with plaques as "presbyophrenic dementia," but he does not mention the occurrence of apoplectiform attacks without arteriosclerosis. And Tumbelaka, in his monograph on Alzheimer's disease, mentions epileptiform attacks as frequently occurring focal symptoms, but not apoplectiform. The writers think that the occurrence of these apoplectiform attacks only towards the end of their patient's life, and not throughout the course of the illness, is more characteristic of Fischer's presbyophrenic dementia and Alzheimer's disease than of cerebral arteriosclerosis. Their case of senile dementia without arteriosclerosis and with apoplectiform attacks can be anatomically connected with the presence of many "Drusen" and fibril degenerations in the cerebral cortex and the corpus striatum. The rigidity and the bent condition of the patient's trunk during life can be ascribed to the "Drusen" and fibril degenerations found in the corpus striatum. [Leonard J. Kidd, London, England.]

Tramer, N. Psychoanalysis and Schizophrenia. [Schweiz. med. Woch., Vol. 54, March 20.]

Tramer calls attention to the pernicious introverting effect of psychanalysis on certain patients with a tendency to ideational and emotional dissociations. Thus it is important to carefully scrutinize the indications for psych-analysis and to safeguard such patients from untrained psychiatrists. (An important article.)

Bickel, H. Affective and Intellectual Delusional Ideas. [Zschr. f. d. ges. Neurol., Vol. LVIII.]

The author makes a division of delusional ideas as affective and intellectual. Those of manic-depressive psychosis, especially those of dementia paralytica, then those of querulous delusion, of the delusion

of jealousy, of the alcoholic, and of the acute alcoholic hallucinosis he considers as arising on an affective basis. Those of dementia precox likewise are often dependent for their direction and content upon abnormalities of the emotional life but their source lies chiefly in dissociation. Those of the twilight states are chiefly to be referred to the dissociation which is prominent here. The author considers paranoia in a narrow sense in which he refers the delusion of jealousy and erotic delusions to an abnormally directed affective life but political delusions and delusions of invention to disturbance of the intellect in one direction.

Ewald, G. Castration in Menstrual Psychosis. [Münch. med. Woch., Vol. 71, March 14.]

Ewald reports a woman, forty-six years of age, suffering from stuporous states, appearing at each menstruation. She was treated by roentgen rays, the menstruation stopped but the mental disturbance returned at the same regular intervals as before. Two years later both ovaries were removed, and after another year, the uterus. The psychosis still returned at about the same intervals.

Seashore, Carl E. A Medico-Psychological Survey of Morons in Iowa. [Iowa State Med. Soc., May 9, 1923.]

It is proposed that the Iowa State Medical Society should initiate a medico-psychological survey of morons in Iowa, to be made by a specially qualified psychiatrist and a clinical psychologist, both of whom must be recognized authorities in mental deficiency, delinquency and crime, and their amelioration. National organizations could be induced to aid in making the survey. The purpose of the survey is to determine the approximate number of persons who should be placed in segregated agricultural and industrial colonies for those persons coming under the following descriptions: (1) Permanently defective, delinquent, or criminal; (2) dangerous to society; (3) occupationally fit for an institutionalized group; (4) not now provided for adequately in either an institution or a home. Most of these will fall under the class of morons. There should be a colony for males and another for females. The survey should examine present charitable and penal institutions to see how many inmates should be in the proposed colony, where they could be treated by industrial, homelike and economic methods. Some inmates of the insane asylums would likewise be better off in such a colony. The school of correction, orphans' homes, and feebleminded institutions all have members who are fitted for such a colony but who are at the present time out of place in their present situations and in some cases a drag on such institutions. An examination of municipal and county court records, and the experience of associated charities, and an examination of schools in selected localities should give the approximate number of such persons in Iowa, and the proportion of morons as here defined, to all mentally deficient, delinquent, or criminal classes. With these data,

and with a study of latest scientific methods in this field, the survey could make recommendations to a legislative committee for the organization and carrying out of the plan. Morons are of many different kinds, but usually each has some limited capacity which can be utilized with the advantage of great specialization which is made possible by the fact that morons lack initiative and are perfectly contented to do the same thing over and over again. Children and adults who are now unhappy, useless, and bad, even though from good homes, can be made happy, useful, and good. By giving them an environment suited to their needs they can be made to become relatively self-supporting, self-respecting, and successful. The effects of the establishment of such colonies would be: (1) Correction of the situations in life of certain misplaced persons who are now a loss to themselves, institutions, and to society; (2) a better home for deficient persons, at the same time relieving society of a danger; (3) organization would be justified over and over again on economic grounds alone, since it could be made practically self-sustaining; (4) it is justified on the principle of allowing these persons the highest possible limits of development of their limited capacities; (5) There would be a reciprocal effect on institutions, homes, and communities from which they are taken. [Author's abstract.]

Roubinovitch, J., et al. Neuropsychiatry in Pediatrics. [Presse Méd., March 29, 1924. J. A. M. A.]

Roubinovitch, Baruk and Bariéty, after having reviewed the main etiologic forms of nervous and mental disturbances in children, state that treatment must be threefold: specific, organotherapeutic and educational. Good results have been reported from treating syphilitic women during their pregnancy, warding off congenital syphilis in the offspring. Among different forms of organotherapy, thyroid treatment has proved relatively most efficient, not only in endocrine disturbances but for arrested development in various ways. Many cases of secondary loss of balance and maladjustment are due merely to neglect in the puberty period. A vigorously organized movement for mental hygiene bearing on education may be the only means to prevent the development of morbid tendencies in adolescence and early adult life.

Claude, H. Chronic Hallucinatory Psychoses. [Progrés Médical, April 5, 1924. J. A. M. A.]

Claude suggests that proper differentiation be made between hallucinations of toxic or infectious, and of endogenous origin. In these latter, the hereditary factors and the individual "soil" ought to be given closer consideration than has been the rule heretofore. Although most mental patients are inclined to the exteriorization of the morbid cenesthetic feelings and ideas of personality attached to the former, yet there is a difference in the interpretation by the patients. A paranoiac interprets everything in reference to himself, but in other patients such ideational

interpretations may secondarily become associated with primary hallucinatory contents, which fact would conflict with the diagnosis of paranoia.

Rüdin, E. Inheritance of Mental Disturbances. [Zschr. f. d. ges. Neur. u. Psych., Vol. LXXXI, Nos. 3–5.]

Rüdin reviews comprehensively the results up to the present time of psychiatric research into heredity. The simply dominant mode has been proved in Huntington's chorea, the simply recessive in myoclonus epilepsy and amaurotic idiocy. Most authors accept a recessive dimeria for schizophrenia while Rüdin believes from his own researches that a trimeria of one dominant and two recessive paired factors will be proved as the proportion for manic-depressive psychosis. Rüdin discusses critically Davenport's theory that individual symptom complexes which appear as essential components of disease processes must have a special hereditary process.

Kleist. Schizophrenias as Psychic Systemic Diseases (Heredo-degenerations). [Kl. Woch., Vol. 2, No. 21.]

The author suggests that such diseases as those designated according to their nature dementia precox, endogenous degenerations and schizophrenias should be comprehended as psychic systemic diseases, since they are due apparently to the effect of endotoxic substances having elective affinity for definite brain systems. The diseases are thus viewed analogously to the systemic neuropathies, such as Wilson's disease, the muscular atrophies, etc.

Norvig, J. Metabolism in Psychoses. [Acta. Med. Scand., 1924.]

This author has studied the metabolism in dementia precox, paresis, epilepsy, and Alzheimer's atrophic sclerosis. He finds that in true epilepsy there is an increased ammonia percentage in the blood before the seizure and diminished urea content of both blood and urine. The condition seems to be traceable to a parathyroid insufficiency, since three patients have shown marked improvement under injections of thyroid and parathyroid extracts, 0.2 c.c. and 0.8 c.c. daily. Nothing characteristic was obtainable in other conditions.

Stockard, C. R. Alcohol Factor in Eliminating Racial Degeneracy. [Am. Jl. Med. Sc., Vol. 167, April. J. A. M. A.]

The experimental work done by Stockard on the effects of alcohol shows it to be a decidedly selective agent acting to injure and eliminate only the weaker and less resistant germ cells, thereby improving the quality of the race. With full appreciation of all the difficulties in transferring the results obtained from the study of one animal kind to another, the following seems to Stockard to be a perfectly conservative and warranted deduction: It is highly improbable that human beings have ever injured or eliminated their normal resistant germ cells with alcohol.

Alcohol has probably eliminated some of the bad. Those nations that have used the strongest beverages through many generations have now, from a standpoint of performance and modern accomplishments, outstripped other nations with less alcohol in their history. This may be due to some selective effects.

Medow, W. Clouding of Consciousness in Dementia Praecox. [Arch. f. Psych. u. Nrvkr., Vol. LXVII, No. 4.]

The author discusses the various forms and degrees of disturbance of consciousness in schizophrenia upon the basis that the latter rests upon an organic disease process. Chronic forms of the disease and the end states reveal more or less clearly marked alterations of conscious activity not a distinct clouding of consciousness. The conscious activity reveals various degrees of sensitivity to injurious influences ranging from comprehension of them to mere attention to them. In the acute forms and in special attacks the disturbance may reach the point of clouding of consciousness which shows the variety of forms found with other organic psychoses, dreamy, unreflective, sensory hyperlucid and reproductively hyperlucid clouding. In the moderate clouding usual here the lucidity is regularly more or less subject to vacillation. Secondary conditions arising from affect and will often conceal the alterations of consciousness but cannot explain them. The clouding of consciousness is evident first in acute cases while negativism and weakness of will appear later. There is only a quantitative difference between the disturbance of consciousness in schizophrenia or in other organic psychoses, the average in the former being distinctly less than in the latter.

Frank. Psyche of the Famine Sufferers. [D. med. W., Vol. 50, No. 19.]

Frank draws an impressive picture of his observations from the severe famine in the Ukraine. At the first there was increase of excitability, later depression and with the bodily decline moral degeneration. Among the lowest indigenous peoples there was cannibalism chiefly among the women (child murder).

Jarrett, R. F. Paraphrenia Systematica with Ten Forms of Hallucinatory Sensation. [Med. Jl., Australia, March 22, 1924.]

This case of paraphrenia systematica of Kraepelin, characterized by the insidious development of a continuously progressive delusion of persecution, to which are added later, ideas of exaltation without decay of the personality. It is placed midway between dementia paranoides and true paranoia. It is separated from the former chiefly on the ground that there is not the same destruction of the personality to justify the appellation dementia and from the latter because hallucinations invariably occur and the delusions tend to be more fantastic. Hearing, sight, smell, taste, touch, temperature and pain sense were affected. Psychomotor and sexual disturbances were also existent.

Bechterew, W. Perversions and Inversions from the Standpoint of Reflexology. [Arch. f. Psych. u. Nervkr., Vol. LXVIII, Nos. 1, 2.]

Bechterew considers the perversions and the inversions inherited disorders but believes that this heredity is only a predisposing cause in a general neuropsychopathic sense It forms the background upon which various external causes may work during the period when the sexuality is maturing. The perversions, which he defines as tendency to abnormal sexual activities with the opposite sex, and inversions, tendency to homosexual activities, develop after the type of the association reflexes. Congenital sexual prematurity and increased sexual stimulability are the constitutional manifestations of the inherited condition. The perversions and inversions, except perhaps in long standing cases, can be cured although an obstacle often exists in the impossibility of establishing conditions where normal sex relations may be carried out.

Foss, H. L., and Jackson, J. A. Relationship of Goiter to Mental Disorders. [Am. Jl. of Med. Sciences, Vol. 167, May.]

Fifty-nine cases of goiter were found by Foss and Jackson in a total hospital population of 1,647. There is, apparently, no definite relationship between goiter and psychoses and nothing to indicate a thyroidectomy in the treatment of the usual psychotic patient suffering from complicating goiter, unless for the relief of mechanical pressure. Operation may be indicated if there be accompanying evidences of true hyperthyroidism, but this latter condition is most rare. Neither hyperthyroidism nor hypothyroidism occurs, except very rarely, among the adult goiter patients of the Pennsylvania hospitals for the insane, the greatest number of goiters being of the so-called multiple adenomatous or nodular forms and unaccompanied by systemic disturbances.

Meyer, Adolph. Constructive Formulation of Schizophrenia. [American Journal of Psychiatry, Vol. I, No. 3, January.]

Meyer regards Kraepelin's obliteration of "terminal dementia as a premature and hasty reaction," since all types of psychoses may in some cases become chronic and deteriorate, while on the other hand what we call dementia precox does not always do so. Mental diseases cannot profitably be studied with an excessive emphasis on diagnosis according to outcome. Histology and serology are not "safe" diagnostic criteria. Behavioristic phenomena are still our best data. Meyer's routine mental examination is to study first the "anergastic and dysergastic disorders" (by which he apparently means perceptual defects). He then considers "functional part-disorders," illustrated as obsession, tension, hysterical, anxiety, asthenic and hypochondriacal states. And then he considers the "more sweeping disorders," with or without substitutions, symbolizations, dissociations and distortions. He regards the tendency toward autistic thinking and projection without adequate pictures by affect or delirium to be the schizophrenic reaction. The practical

summary of the article is a proposal that we abandon diagnosis by prognosis and replace the term dementia precox by schizophrenia recognizing transition forms. [Menninger.]

Lurie, L. A. The Subnormal and Psychopathic Child as Exemplified in Special Clinic. [Jl. A. M. A., Vol. 82, Oct. 13.]

1. The nature of a child's conduct reactions depends on two factors: (1) his innate physical and mental capacity for reacting, and (2) the nature of his environment. Hence, when we are confronted with any form of psychopathy in childhood, both of these factors must be properly evaluated. In addition, the reactions of the child when placed in a normal environment must also be known. The data thus obtained, when correlated, permit the making of a correct diagnosis and the outlining of the proper treatment. At the psychopathic institute of the Jewish Hospital we have created an observation station where such a complete study is carried out scientifically. 2. Enough children have been reclaimed for society as a result of the intensive study carried out at the psychopathic institute to warrant the statement that it is unfair to commit any child who shows any form of antisocial behavior or conduct disorder to a corrective, or custodial institution before he has been given the benefit of such a complete study. 3. Feeblemindedness should not be considered a clinical entity. Rather, it should be looked on as symptom of some grave, underlying constitutional disturbance, the correction of which very often leads to a marked improvement, if not to an entire cure, of the retarded mental state. Such a thesis opens enormous possibilities for solving a problem that has been looked on by many physicians as hopeless. Furthermore, it permits the adoption of a constructive program in place of the merely palliative one of building more and more institutions for the feebleminded.

Ritterhaus, E. The Manic-Depressive Psychosis, Organic Brain Disease, and Epilepsy. [Zschr. f. d. ges. Neurol., Vol. LVI.]

The author considers the manic-depressive disposition an endogenous one present with every individual. It may manifest itself as a disease symptom in connection with brain diseases such as syphilis, brain tumor, diffuse arteriosclerosis, etc., also as an epileptic equivalent in epilepsy. It manifests itself also as a result of toxic or endotoxic processes, as in the presence of exhaustion toxemia, alcohol, infection from toxic injuries, in Basedow's disease and myxedema, in vagotonia, in general as a result of hypo- or hyperfunction of one or more of the endocrinous glands. It is also a genuine remnant of manic-depressive psychosis as an "endogenous affect psychosis," and further as a psychogenic reaction analogous to the hysterical reaction or combined with this.

Book Reviews

Guizzetti, P. Anatomia Patologica del Sistema Nervoso Centrale. [Unione Tipografico-Editrice Torinese, Torino.]

Professor Pio Foa has been editing a treatise of pathological anatomy of which parts IX (192 pp.) and X (320 pp.) deal with the pathological anatomy of the nervous system and are contributed by Professor P. Guizzetti of Parma.

Part IX first deals with the general pathological histology of the brain, after a brief consideration of general histological features. Degenerative processes of the neurone, alterations in the dura mater, as pachymeningitis, tumor and senile changes, various arachnoid alterations. Encephalitis in its various forms is then dealt with, hemorrhage, brain tumors and parasitic tumors—these are among the chief features discussed in this first volume. In Vol. X he takes up the pathological histology of the spinal cord, the medulla, the peripheral nerves and the sympathetic nervous system.

These volumes cover a wide range, are very concisely and systematically written, the general viewpoint reflects the best of modern studies and the typography and illustrations are admirable. Excellent bibliographical references of contemporaneous literature to about 1920 are features of added merit to this most excellent treatise.

Haeberlin, Carl. Grundlinien der Psychoanalyse. [Otto Gmelin, Munich, Mks. 3.]

A short critical discussion not so much of psychoanalysis as of the general principles which the author himself deduces. It is worth reading although quite fragmentary and at times shows evidences of misapprehension, as, for instance, his conception of Freud's idea of Censorship and the Super Ego.

The author, like many another, does not distinguish in his discussion the differences, let us say, between an analytical chemistry which would determine quantitative and qualitative factors concerning a given ore and the purposes to which the products obtained from it may be put by a manufacturer. This is particularly evident when he speaks of the small emphasis laid upon ethics in the analytic technique. This lack of logic concerning the specific use to which a method of investigation is to be put is here not so great a fault as in many other summaries, for in general the author is in sympathy with the ideas, but he is careless in his thinking.

Testing a horse's knee jerks—as a method—does not determine whether he will win the Derby—as a procedure, and no one with any sense would suppose it should. Freud's work has been with what

analysis may be able to show—as a method—the rest of it is all superstructure built by others.

Parson, Beauford Sims. LEFTHANDEDNESS. [The Macmillan Company, New York.]

This is a very interesting and intelligent discussion of lefthandedness introducing some new factors for correllation particularly between the eye and the hand.

The author discusses some of the prevailing suggestions called Habit, Heredity, Nursing, Visceral Distribution, Primitive Warfare, Brain Blood Supply via Subclavian Arteries, Cerebral Hemisphere Variations, etc., and closes with what he calls ocular dominance. This summary is very light and easy and is as good as many of the more heavy discussions, since most of them are results and not causes. It is made good by an excellent bibliography.

Chapter III repeats the kindergarten idea of five senses and later chapters discuss eye dominance as tested by the author's manuscope. This brings him to the idea that unilateral sighting has played a preponderant rôle. This has become fixed and right eyedness = right handedness. He speaks of limitations in binocular vision but we find no real reason why one side is chosen rather than the other—here as anywhere else. Here he falls back upon poor Abbe Mendel, and no real causative factors are revealed.

Szymanski, J. S. GEFÜHL UND ERKENNEN. [S. Karger, Berlin.]

In this very careful and quite elaborate monograph of 200 pages the author would seek to gain further insight into the relationships of feeling to knowledge. It is thus a contribution to Epistomology as well as a study of the Soul-Body problem, and one of considerable significance.

Starting upon the now well recognized principle that disease is but a type of nature experiment, the author calls upon psychopathological data as offering experimental evidence to further the understanding of the problems involved.

From the "Feeling" side the author has made an extensive investigation as to their quality and structure and would essay a classification of these situations. The chief theme is to ally these to the function of higher types of knowledge and especially of those bridging structures which have been termed "unconscious knowledge." Finally a classification of the gnostic functions is offered.

Inasmuch as this is a thoroughly clinical piece of work and not a library effort it is of great value and moreover a very stimulating piece of work. It may be mentioned it is No. 33 of Bonhoeffer's interesting series of monographs.

Drever, James. THE PSYCHOLOGY OF INDUSTRY. [E. P. Dutton and Company, New York.]

The author, lecturer on psychology in the University of Edinburgh, has already given us a delightful book upon the Psychology of Everyday Life. Here he contributes a popular manual for the ordi-

nary man who is interested in human engineering as applied to industry. It gives us an excellent résumé of the field but is a little inclined toward the "mental measurement," "tests of efficiency" and related types of thinking. Excellent in the main it lacks somewhat in its underemphasis upon emotional attitudes in their relation to human engineering.

Strümpell, Adolf. Aus dem Leben eines deutschen Klinikers. [F. C. W. Vogel, Leipzig.]

It was but a short time after the appearance of this delightful series of memories and observations that this most genial of German clinicians died.

Strümpell's Text Book of Medicine was one of the most popular texts, as ably translated by P. C. Knapp, before Osler became America's great classic, and his numerous contributions to neurology have left an impress of his skill which will live long in the annals of this field.

Here in a personal sketch of his life one may read much that can but be guessed at by the students of his more technical efforts. From his original Dorpat home, where his father was professor of philosophy, his stays in Stuttgart and Prague, his medical studies at the university of his original and then his adopted home town, Leipzig, these are most discriminatingly commented upon and the student of the history of medicine can cull much therefrom.

Then follow his work in Vienna, then Leipzig, his Erlangen and Breslau periods—a short stay again in Vienna and his final settling down in the Leipzig clinic. These are short chapters upon his work and his contacts.

This is a most attractive small autobiography of a great clinician of especial interest to neurology.

Jackson, Hughlings J. Eine Studie ueber Krämpfe. Uebersetzt von Otto Sittig, Prague. [S. Karger, Berlin.]

Hughlings Jackson's interesting and highly valuable "Study of Convulsions" is here translated into German since the translater believes that it is a fundamental contribution to neurology without a knowledge of which many unnecessary and faulty conceptions have arisen. In quoting Arnold Pick of Prague, who deemed Jackson one of the most profound thinkers in neurology, we agree with the translater's idea of the value of this work and of Jackson's general conceptions.

Fischer, Bernh. Vitalismus und Pathologie. [Julius Springer, Berlin.]

We recently read a delightful review in which the author stated that while seated on some Andean craggy fastness, one of the volumes of this series—Roux's Entwicklungsmechanik—came in his belated mail and made the whole day of interest to him. It is so with most of this series, of which the present one is No. 34, and deals with the problem of vitalism in pathology.

Haldane's Daedalus has made us partly acquainted with this aspect of biological theory. Aristotle spoke of the "power" behind the organism, the entelechy, and all thinking students have wondered how to envisage it without falling into the theologians' God. Here the problem circulates about what it is that animates the growth of tumor formation. Pathology is but one of the branches of biology, but for physicians it is a big and an important one and anything that can throw any light upon new growth, be it from the Virchow standpoint of irritation, or the Freudian standpoint of libido investment, is welcome.

This essay of 200 pages is scholarly and inclusive and can be most heartily recommended. Vitalism is not much in favor in these ages, even though its definition is hard to find, but this, apart from the general problem of the relation of cellular pathology to organismic pathology, is well outlined.

Ricker, Gustav. Pathologie als Naturwissenschaft. Relationspathologie. [Julius Springer, Berlin.]

Pathology as a natural science; this is an enticing program and here is a fascinating monograph.

Here is no sterile descriptive stuff, but a living branch of science, most beautifully handled and comprehensively discussed.

As has been emphasized in these columns for years, until the part played by the nervous system in the synthesis of the body as a whole be emphatically recognized, no true pathology can be written. This is the author's initial statement of the stimulation of the nervous system as the primary process in organic variation of cellular activity, the principle upon which his relational pathology is built. This is a pathology which a neurologist can understand and sympathize with. It is a book of 400 pages but there is not a superfluous one. It is the richest nugget in this field that we have found.

Brüning, F., u. Stahl, O. Die Chirurgie des vegetativen Nervensystems. [Julius Springer, Berlin. 18 mk.]

The sympathetics have come back to their own. Claude Bernard has not been forgotten and the renewed interest in the life nerves, as Müller has recently christened them, is here evidenced in a complete monograph upon vegetive neurological surgery.

It is also an excellent anatomical guide as well.

This book is entitled to an exhaustive and detailed review. It contains so much of great interest and of moment for all surgeons, not alone those of neurological bent. No matter where a surgeon cuts he is going to involve the vegetative nervous system. Sometimes he may cause irreparable damage which though not obvious at first may ultimately be understood in terms of vegetative pathology.

This is the first important and exhaustive monograph in this field and is of as much value to neurologists as to surgeons.

Liepmann, Wilhelm. Gynäkologische Psychotherapie. [Urban und Schwarzenburg, Berlin u. Wien.]

This is in our opinion one of the most important and striking books, which have come to the reviewer's desk in many years. It is all the more an astounding piece of work in that gynecology may well have been classed, particularly in its tamponing period, as one of the most doubtfully reputable of the specialties. Not a little quackery went with pessaries, tampons, douches, etc., etc.

When no less a figure than the professor of gynecology at Harvard Medical School openly declared that at least 80 per cent of the patients who had come to him during a certain period of his work had so-called gynecological disorders, which were psychogenic in origin, one can see that some one was telling an important truth which Dejerine had emphasized some twenty years ago that there were false gastropathies, false enteropathies, false gynecopathies, false cardiopathies, etc., etc., and that the greater part of the average practice of medicine was made up of these emotionally caused and psychically determined disturbances.

In the present work, a well rounded one of some 200 pages, this general viewpoint is carefully and exhaustively demonstrated and abundant evidence is forthcoming from this professor of gynecology in the University of Berlin that he is alive to the important situation that psychotherapy in gynecology is one of the most important of all therapies.

Garzella, Renata. L'Endocrinologia nei Rapporti Eziologica con le Dermatosi. [Arti Grafiche Car. F. Mariotti, Pisa.]

The present day slogan in advanced medical circles is to portray the "body as a whole." In other days the "organs" were the spot lights of inquiry. Liver, lungs, kidney, skin, muscles; these had diseases or disorders per se—but now, nothing in itself can be interpreted without the rest of the body as a participant.

The present monograph grants a partial bowing acquaintance to this principle. It does not go the whole hog, but it does admit that skin disturbances *may,* yes, even *must* be considered in a dual relationship, *i.e.,* they may be conditioned upon endocrinological relationships.

Thus, slowly but inevitably, the "body as a whole" is being acknowledged. Here skin and endocrines are seen in a definite correlation.

The details of this coördination are most skilfully portrayed, and yet a larger synthesis lurks behind them. This the author glimpses but does not enter into. In this respect this most intriguing monograph leads one many steps in advance of the dermatology of Unna and others of the "Mid Victorian" period in dermatology. As such it is to be welcomed. When dermatology—as the newer researches of Müller of Hamburg, of Bloch of Berne, and others—will show its possibilities, as a philosophy of skin diseases, then one can hope that dermatology will enter into the league of nations of the body as a "whole" in medicine.

Notes and News

THE AIM AND OBJECT OF THE ASSOCIATION FOR RESEARCH IN NERVOUS AND MENTAL DISEASE

The Association for Research in Nervous and Mental Disease originated in the year 1920 among a group of neurologists and psychiatrists, members of the New York Neurological Society.

To this group it had long seemed that the usual type of neurological association is discursive in its effort, wasteful of time and energy, and rather purposeless in its organization and control. Its programs are prone to include subjects covering the entire realm of neurology and psychiatry, presenting little of intensive interest to each individual member and endeavoring to contain material which would cover the widest possible territory and appeal to the most catholic tastes. These general meetings are also often marred by the protracted and wandering discussion which so frequently follows the reading of each paper. The founders of this organization envisaged an entirely new type of medical gathering, one devoted to a single subject, chosen one, two or three years in advance, the various subdivisions of the subject being apportioned to investigators already interested in that particular aspect of the topic and so situated that they can devote to study of their own particular part of the program the length of time sufficient for the preparation of reasoned and carefully elaborated conclusions. It was in order to foster these advantages and eliminate these drawbacks that the Association for Research in Nervous and Mental Disease was founded.

During its six years of existence the membership of the Association has steadily increased until its list of members contains the representative members of the neurological and psychiatric specialists of the major centers of the North, South, East and West. The meetings of this Association are held annually during the week intervening between Christmas and New Year's Day, in the city of New York. Its headquarters have, since the time of its founding, been the Hotel Commodore, on East Forty-second Street, whose facilities have always been generously and completely laid at the professional and social call of the organization.

In so far as its formal organization is concerned, the Association has its elected officers: President, Vice-President, Secretary-Treas-

urer, and Assistant Secretary, and a Commission which sits as a body of inquisitors, hearing and questioning the contributors upon their research efforts. The Officers and Commissioners for the current year are:

President: Dr. Frederick Tilney, New York.
Vice-President: Dr. Foster Kennedy, New York.
Secretary-Treasurer: Dr. Henry Alsop Riley, New York.
Assistant Secretary: Dr. Thomas K. Davis, New York.
Commissioners: Dr. Frederick Tilney, New York.
Dr. Lewellys F. Barker, Baltimore.
Dr. L. Pierce Clark, New York.
Dr. Charles L. Dana, New York.
Dr. Francis X. Dercum, Philadelphia.
Dr. J. Ramsay Hunt, New York.
Dr. Smith Ely Jelliffe, New York.
Dr. Foster Kennedy, New York.
Dr. Adolf Meyer, Baltimore.
Dr. Stewart Paton, Princeton.
Dr. Hugh T. Patrick, Chicago.
Dr. Lewis J. Pollock, Chicago.
Dr. Bernard Sachs, New York.
Dr. Sidney I. Schwab, St. Louis.
Dr. William G. Spiller, Philadelphia.
Dr. M. Allen Starr, New York.
Dr. Israel Strauss, New York.
Dr. E. W. Taylor, Boston.
Dr. Walter Timme, New York.
Dr. T. H. Weisenburg, Philadelphia.

The topic for each successive yearly session is chosen by the Commission. The subject is then turned over to the Program Committee which determines upon the major lines which the investigation of the subject shall follow most advantageously. The major subdivisions are then broken up into smaller and smaller topics in order to cover the entire field as thoroughly as the facilities of time and the availability of investigators will allow. The definitive titles are assigned wherever it is possible to investigators who have already evinced interest and conducted research in that particular aspect of the subject under consideration. Each contributor is requested to forward to the Program Committee at least six weeks before the scheduled date of the meeting, an abstract of his contribution, which is mimeographed and copies are distributed to the members of the Commission as long before the meeting as possible. In this way the Commissioners are acquainted with the conclusions which each contributor will present before the meeting and by familiarizing themselves with the methods of investigation used and the results obtained

they are enabled to subject the contributors to a searching examination in order to bring out important or debatable points. Following the presentation, the paper is open for questioning from the Commission, and after this opportunity has been exercised by any or all of the Commissioners, questions may be advanced from the floor, being in writing, however, and presented through a member of the Commission. This form of procedure has been adhered to in order to provide an orderly and dignified conduct of the meeting and to limit the questions to those which are of importance and which may bring out material of interest, either insufficiently presented or open to contradiction or refutation. These questions and answers are all transcribed verbatim. Following the conclusion of each yearly meeting the papers are collected and submitted to the Editorial Committee for the preparation of the annual volume. The questions and answers are distributed to those responsible for them and are corrected personally by the individual asking the question and the contributor making the answer, being then attached to the paper which it follows as an appendix. In the editing of the contributions care has been exercised that no material of interest or originality shall be lost, and the prerogatives of an editor have been exercised only in removing material which has been covered to better advantage and in more logical sequence at some other point in the proceedings.

The six volumes resulting from the annual meetings of the Association have been prepared with the expectation and hope that they will form a series of archives or annals, each one of which will present a comprehensive review and study of each subject taken up for investigation by the Association. An effort has been made to procure a complete bibliography in order that each volume may act as a compendium of the sum of scientific knowledge of the subject up to and including the date of publication. The volumes so far prepared by the Association are the following: 1920, Epidemic Encephalitis; 1921, Multiple Sclerosis; 1922, The Convulsive State (the publication of this study has been delayed and is awaiting further investigation); 1923, Heredity in Nervous and Mental Disease; 1924, the Cerebrospinal Fluid. The Association undertook in 1925 the investigation of Schizophrenia (Dementia Precox) and this volume is already in preparation for publication. The subject chosen for presentation in December, 1926, is the Cerebellum in its evolutional, developmental, morphological, clinical, and pathological aspects.

These volumes have continually increased in size, in complete-

ness, and in the thoroughness with which the subject has been considered. The volume on Epidemic Encephalitis, published in 1921, contained two hundred and fifty-eight pages, whereas the volume on the Human Cerebrospinal Fluid, published in 1926, contains over six hundred pages. In preparing the papers for publication in the volume on Schizophrenia the several contributors have been urged to present their subjects in as complete and comprehensive a form as is possible in order that the publication may not only be a record of current investigative efforts, but will also serve as a standard reference volume in the consideration of that disease. These volumes may be obtained from the publisher, Paul B. Hoeber, 69 East Fifty-ninth Street, New York City, individually or as a series to which successive volumes as they appear will be added.

Each year a compiling secretary is appointed by the President who collects during the ensuing year any new or important material which may appear in connection with the subject assigned to him. This material is yearly presented to the Association and filed. When a sufficient amount of material has accumulated, these continuation reports will be brought out as appendices to the already published studies of the Association. In this way the bibliography of important additions to each subject is kept up to date and abstracts of new material added to the already published volume.

In preparing its programs the Association is not limited in its contributors to members of its own organization and it has on many occasions obtained the coöperation of investigators who have been active in closely related fields bearing upon the subject under investigation. Similarly the Association has not limited itself to physicians for the membership of its Commission and it is free to invite recognized leaders in allied fields who may be able to guide or to aid in its deliberations and in its inquisition of the contributors to the program. Each year the finished publication of the preceding year is distributed free to each member of the organization.

The membership of this organization is limited to those whose major interest is in neurology and psychiatry. In theory the Association accepts only those who are already members of some recognized neurological or psychiatric society or association, but in practice this qualification is not rigidly adhered to as it would in many instances exclude from membership young and enthusiastic investigators who have not as yet been able to enroll themselves in one of the older and longer established associations. The Commission, therefore, in these individual cases has acted, and will continue to

act, on the merits of each case in accepting such candidates for membership.

The Association for Research in Nervous and Mental Disease purposes to direct its efforts along recognized lines of inquiry and research in order to facilitate the investigation of difficult and abstruse subjects within the realms of neurology and psychiatry. The chief aim of this Association is to foster intelligent, concerted and coördinated research along one major line of neurological or psychiatric endeavor during each year. With this end in view the Association has endeavored to establish and augment each year a fund which may be devoted to the furtherance of research. It is the ultimate aim of this Association to establish itself so thoroughly and to bulwark its financial resources so strongly that it may eventually accumulate a sum of money, the interest of which shall be used in financing the research work assigned for each year. The Association believes that only in this way, by concerted effort and by pre-arranged foresight, can progress be made most economically in time and money in the unending warfare with the various unsolved problems which hinder the scientific advance of neurology and psychiatry. The Association desires to extend its membership as widely as may be practicable and consistent with its aim, objects and qualifications for membership. Anyone interested in the Association and qualified according to the criteria expressed above can obtain further information from the Secretary, Dr. Henry Alsop Riley, 870 Madison Avenue, New York City.

The American Neurological Association meets in Atlantic City, June 1, 2, 3, 1926, at the Hotel Ambassador.

The American Psychiatric Society, the American Psychoanalytic Society, and the American Association for the Study of Epilepsy meet in New York from June 5 to June 10 at the Waldorf Hotel.

N. B.—All business communications should be made to Journal of Nervous and Mental Disease, 64 West 56th St., New York.

All editorial communications should be made to Dr. Smith Ely Jelliffe, Managing Editor, 64 West 56th St., New York.

INDEX TO VOLUME 63

Figures with asterisk (*) indicate original articles and are accompanied with title. Figures unaccentuated, accompanied with title, indicate abstracts.

ABDERHALDEN reaction, significance of, in field of psychiatry and nervous diseases ... 537
Abdominal reflex in epidemic encephalitis ... 284
Acetone, determination of in breath ... 505
Achard, C. ... 519
Acne, roentgen rays versus vaccines in treatment of ... 265
Adenoma sebaceum and hypernephroma with tuberous brain sclerosis ... 185
Adie, W. J. ... 501
Adolescent psychoses and dementia precox ... 532
Adrenalin, experimental, in the diabetic ... 169
injections, experimental, in mental diseases ... 534
Adson, A. W. ... 630
Aievoli ... 84
Akinetic-hypertonic symptom complex ... 282
Alcohol in eliminating racial degeneracy ... 641
Aleijouanine ... 268
Alford, Leland B. ... 526, *586
Allen, F. M. ... 272, 503
Allers, R. ... 538
Allport, Floyd Henry ... 303
Alzheimer's disease and senile dementia ... 637
Amaurotic family idiocy ... 187
idiocy, birth control in families with ... 186
Anaemic zones, viscero-cutaneous. 166
Anatomy, comparative, of nervous system ... 545
Angioneurotic edema ... 164
Anhedonia ... 416
Anton, G. ... 276
Anxiety, rôle of in economy of mental life ... 379
Apelian, A. S. ... 72
Aphasia ... 311
Arbeit ... 399
Arbuse, D. ... 613
Argyll-Robertson pupil, unilateral *58
Arndt-Schulz law ... 180
Arnheim, E. E. ... 612
Arrowsmith ... 203
Asher, L. ... 498
Ataxia, Friedreich's, abortive type of ... 149
tabetic, pathogenesis of ... 402
Atrophic myotonia ... 501
Auricchio, L. ... 501

BABINSKI, J. ... 179
Bailey, P. ... 178
Bailey's textbook of histology ... 197
Baldness, cause of ... 68
Balthazard, V. ... 192
Banting, F. G. ... 169, 273, 504
Barber, H. W. ... 164
Barnes, Harry Elmer ... 312
Barrett, A. M. ... 531
Barrett, Albert N. ... 416
Barrett, E. Boyd ... 426
Barron, M. ... 92
Basedow, morbus, changes in striated muscles in ... 625
Bechterew, W. M. ... 102, 643
Behavior disorders, post-encephalitis ... 283
Behavioristic attitudes caused by speech disorders ... *17
Belladonna delirium ... 532
Bellucci, Luigi ... 195
Benedik, Lalislas ... 199, 623
Benjamin, Harry ... 73
Berger, W. ... 173
Bergson's conceptions as applied to psychopathology ... *553
Berk, Arthur ... 253
Bernard, E. ... 523
Bernfeld, Siegfried ... 304, 540
Bessau, G. ... 90
Bickel, G. ... 408
Bickel, H. ... 638
Bignami, G. ... 635
Bing, Robert ... 187, 203
Biography of Ziehen ... 308
Biology, general and professional. 301
of sorrow ... 292
Birth control in families with amaurotic idiocy ... 186
Bjerre, Andreas ... 311
Bliss, S. W. ... 172
Bloedorn, W. A. ... 634
Blood pressure in diabetes ... 504
sugar content of in epidemic encephalitis ... 394
Body-soul ... 205
Bogert, J. ... 506

Boisen, A. J. 409
Bone atrophy and sympathectomy 628
destruction and parathyroid hyperplasia in generalized carcinomatosis 506
Book reviews:
Allport, Floyd Henry, Social Psychology 303
Barnes, Harry Elmer, Psychology and History..... 312
Barrett, E. Boyd, Man, His Making and Unmaking..... 426
Bellucci, Luigi, Localizzatione dei Centri Corticale dei Movimenti Laringei..... 195
Benedek, Ladislas, The Present Status of the Treatment of General Paresis..... 199
Bernfeld, Siegfried, Vom dichterischen Schaffen der Jugend 540
Bernfeld, Siegfried, Vom dichterischen Schaffen der Jugend. Neue Beiträge zur Jugendforschung. Quellenschriften zur seelischen Entwicklung, Nr. iii..... 304
Bing, Robert, Kompendium der topischen Gehirn und Rückenmarksdiagnostik. Sechtse Auflage..... 203
Bjerre, Andreas, Zur Psychologie des Mordes..... 311
Brüning, F., u. Stahl, O., Die Chirurgie des vegetativen Nervensystems 648
Clark, L. P., Meyer, A., et al., Studies in Psychiatry. By Members of the New York Psychiatrical Society. Vol. II 428
Colella, Rosolino, Instituto di Clinica delle malattie Nervose e Mentali d R. Universita di Palermo 427
Culpin, Millais, The Nervous Patient 301
Curschmann, Hans, Nervenkrankheiten. Die wichtigsten Kapitel für die Praxis. Klinische Lehrkurse der Münchener medizinischen Wochenschrift. Band 2..... 306
Cushing, Harvey, The Life of Sir William Osler. Two Volumes with Illustrations. Oxford Medical Publications... 204
Draper, George, Human Constitution. A Consideration of Its Relationship to Disease.. 307
Drever, James, The Psychology of Industry 646
Dunlap, Knight, Old and New Viewpoints in Psychology... 196
Book reviews—*Continued*
Dupré, Ernest, Pathologié de l'Imagination et de l'Emotivite 426
Dwelshauvers, Georges, Les Mecanismes Subconscients... 195
v. Economo, Constantin, und Koskinas, G. N., Die Cytoarchitektonik der Hirnrinde des erwachsenen Menschen. With an atlas of 112 microphotographic plates..... 542
Elsberg, Charles A., Tumors of the Spinal Cord..... 196
Faber, K., Holst, P. F., u. Petrén, K., Laerebog I. Intern Medizin. Band III, IV. Gyldendalske Boghandel..... 309
Fischer, Bernh, Vitalismus und Pathologie 647
Forel, O. L., La Psychologie des Névroses 305
Freud, S., Collected Papers. Vols. I–II..... 541
Garzella, Renata, L'Endocrinologia nei Rapporti Eziologica con le Dermatosi..... 649
Gillis, James S., False Prophets 203
Greenfield, J. G., and Carmichael, E. A., The Cerebrospinal Fluid in Clinical Diagnosis 195
Guillain, Georges, Études Neurologiques. Deuxieme Serie. 202
Guizzetti, P., Anatomia Patalogica del Sistema Nervoso Centrale 645
Haeberlin, Carl, Grundlinien der Psychoanalyse 645
Heyer, G. R., Das korperlich-seelische Zusammenwirken in den Lebensvorgängen..... 205
Jackson, J. Hughlings, Neurological Fragments. With biographical memoir by James Taylor, and including the Recollections of the late Jonathan Hutchinson and Charles Mercier..... 540
Jackson, Hughlings J., Eine Studie ueber Krämpfe..... 647
Kappers, C. V. Ariëns, Tabulae Anatomo-Comparatival Cerebri 545
Lévy, Gabrielle, Les Manifestations tardives de l'Éncephalite Épidémique. Preface de Prof. Pierre Marie 302
Lévy-Valensi, J., Précis de Diagnostic Neurologique..... 196
Lewis, Sinclair, Arrowsmith... 203
Liepmann, Wilhelm, Gynäkologische Psychotherapie 649

Book reviews—*Continued*
Lugiato, Luigi, I. Disturbi Mentali. Patalogia Speciale delle Anomalie dello Spirito..... 202
Menge, Edward J., General and Professional Biology. Vol. I. General Biology..... 301
Niessl von Mayendorf, E., Kritische Studien zur Methodik der Aphasielehre..... 311
Parson, Beauford Sims, Left-handedness..... 646
Pasqué, Ernest H., The Electro-Chemical Factor in Neurology..... 310
Pottenger, Francis Marion, Symptoms of Visceral Disease. Third Edition..... 425
Rademaker, G. G. J. De beteekenis der roode kernen en van het overige mesencephalon voor spiertonus, lichaamshouding en labyrinthaire reflexen 94
Ricker, Gustav, Pathologie als Naturwissenschaft. Relationspathologie 648
Schwarz, O., Psychogenese und Psycho-Therapie körperlicher Symptome. R. Allers, J. Bauer, L. Braun, R. Heyer, Th. Hoepfner, A. Mayer, C. Pototsky, P. Schilder, O. Schwarz, J. Strandberg. Edited by Oswald Schwarz.. 197
Strong, Oliver S., and Elwyn, Adolph, Bailey's Text-Book of Histology. Seventh Edition..... 197
Strümpell, Adolf, Aus dem Leben eines deutschen Klinikers 647
Sullivan, W. C., Crime and Insanity..... 304
Szymanski, J. S., Gefühl und Erkennen..... 646
Turner, Clair Elsmere, Personal and Community Health 311
Van Teslaar, J. S., An Outline of Psychoanalysis 302
von Kries, Johannes, Allgemeine Sinnesphysiologie 425
Wallin, J. E. Wallace, The Education of Handicapped Children 307
Wanke, Georg, Psychoanalyse. Geschichte, Wesen, Aufgaben und Wirkung 427
Ziehen, Th., Die Philosophie der Gegenwart im Selbstdarstellung 308
Boston Society of Psychiatry and Neurology 61, 253
Botulism 287
Bouman, L. 394
Bowman, Karl M. 260
Boyd, G. 164
Brachial plexus, mechanical injury of 636
Bradykinesias, postencephalitic Parkinsonian 522
Brain and spinal cord diagnosis.. 203
cytology of 542
disease, organic 644
neoplasm 620
tumor, metastatic 617
Brancati, R. 269
Breukink, H. 536
Brock, S. 373
Brouwer, B. 80
Brüning, F. 648
Bruusgaard, E. 181
Burden, J. F. 86
Burns, severe superficial, toxemia of 164
Burridge..... 295
Butterfield, George K. 294
Buzzard, E. Farquhar..... 402
Byrne, Joseph *105
CALCIUM in blood in spasmophilia..... 509
Cancer and nerve substance, relation between 518
Carbohydrate metabolism and pancreas 169
Carcinomatosis, generalized, parathyroid hyperplasia and bone destruction in 506
Cardiac psychoses 533
Carmichael, E. A. 195
Carrara, M. 75
Carroll, Robert S. 293
Carter, H. S. 82
Castration in menstrual psychosis 639
Catamnesis, contribution to theory of paranoia 537
Catatonic seizure 413
Causalgia..... 82
Cerebellar diagnosis, labyrinthine tests in 277
functions, genesis of..... 276
Cerebellum, motor functions and disturbances of development of..... 276
Cerebral lesions, frontal reflex associated with 179
Cerebrospinal fluid, constitution of in syphilis of nervous system..... 182
in clinical diagnosis..... 195
in congenital syphilis..... 400
Chapman, R. McC. 536
Charcot..... 246
and the arts 252
centennial in Paris 247
hypnotist and diagnostician.... 249
Chelonidae, changes due to avulsion of sacro-lumbar roots in 635

Chickenpox and herpes zoster... 636
Child problem 87
subnormal and psychopathic... 644
Childhood and poetry.....304, 540
Children, handicapped, education of..... 307
Chlorosis, ovarian origin of..... 74
Clark, L. Pierce..*248, 428, 479, *575
Claude, H. 640
Cocain addiction 289
seat of mydriatic action of.... 80
Cohen, Harry 71
Colella, Rosolino 427
Coleman, C. C. 514
Color blindness, sensibility of fatigued eye to differences in wave length in relation to.. 511
fields, effect of intensity of stimulus on size and shape of 512
Concepcion, I. 270
Condat 633
Confusional paranoia 288
Conroy, M. J. 271
Consciousness, ancient idea of and the human mind *433
Convulsions, study of 647
Cope, Z. 516
Covey, G. N. 497
Cramer, A. 408
Cramer, W. 69
Creatinin and creatin in muscle extracts 626
Crime and insanity..... 304
Criminal insane, intelligence of.. 288
Culpin, Millais 301
Curschmann, Hans 306
Cushing, Harvey 204
Cutaneous reactions, desensitization by 265
Cytology of brain 542

DAMON, Le Grand A. *446
Dana, Charles L. 252
Dart, Raymond 499
De Boer's experiment on frog... 624
Degeneracy, racial, alcohol as factor in eliminating..... 641
Dehydration, therapeutic use of in hypomania 62
De Josselin de Jong, R. 83
Delirium, belladonna 532
psychasthenic..... 412
Delusion and superstition..... 88
Delusional ideas, affective and intellectual..... 638
Dementia precox, acute psychoses with symptoms resembling 288
and adolescent psychoses.... 532
aseptic meningitis in combating problem of 293
attacks in 526
clouding of consciousness in. 642
Dementia precox—*Continued*
diagnosis and treatment of.. 410
in identical twins *135
Deming, Julia 258
Dermographia, white 70
Dermographism..... 270
Desensitization by cutaneous reactions..... 265
Dessaint..... 70
Deterioration, apparent, with odd behavior but without trends.. 258
Diabetes and internal pancreatic function of thyroid..... 503
blood pressure in 504
dogs, effects of insulin on..... 172
during pregnancy 504
in children 275
mellitus..... 272
among Filipinos 270
changes in the islands of Langerhans in 271
classification and therapeutics of..... 170
complications of 275
in man 503
new pancreas preparation in treatment of 275
morality from 505
pancreatic hormone in 273
pancreatic, in dogs, relation of thyroid to 503
pathology of 272
Diabetic edema 274
experimental adrenalin in..... 169
mortality, decreasing 172
Diagnosis, neurological 196
Diathermia in treatment of multiple sclerosis 491
Diller, Theodore 91
Diplegia, facial, in neoarsphenamin polyneuritis *352
Doerr, R. 173
Donkersloot, W. N. 637
Draper, George 307
Drever, James 646
Drew, A. H. 69
Dreyfus, G. L. 182
Drug addiction, problem of..... 295
poisoning..... 287
Duke, W. W. 267
Dunlap, Knight 196
Dupré, Ernest 426
Dura, tuberculoma of *23
Duval..... 181
Dwelshauvers, Georges 195
Dystrophia myotonica 501
Dystrophy, familial muscular.... 622
muscular..... 627
progressive, of muscles..... 502

FBAUGH, Franklin G. 393
Ebright, George E. 287
Echo pruritus 166

Echols, George L. 538
v. Economo, Constantin 542
Eczema, constitutional of infants, hypersusceptibility in.. 266
treatment of with Finsen light. 266
Edema, diabetic 274
pulmonary, encephalitic 523
Electric accidents from house current 192
excitability, endocrine factor in 518
shock, death from house current 192
pathologic changes in those rendered insensible by it and treatment of such cases 189
Electrochemical factor in neurology 310
Electropuncture of spine in tabes. 403
Elsberg, Charles A. 196
Elwyn, Adolph 197
Emotion and imagination..... 426
Encephalitic pulmonary edema... 523
Encephalitis 520
and respiratory rhythm..... 286
chronic lethargic, neuroses in course of 153
diffuse periaxial 394
epidemic 284, 287, 302
abdominal reflex in..... 284
atypical and masked forms of *1
bacteriology of 173
chronic 286
in epidemic of 1920..... 522
inoculation of herpes in..... 522
mental symptoms in 154
neuropsychiatric sequelae of in school children..... 393
ocular symptoms of..... 393
peripheral and radicular types of 525
sequelae of 285
subacute 487
sugar content of blood and spinal fluid in..... 394
unusual signs of..... 156
lethargica.....173, 286, 520, 524
herpetiform eruptions in.... 524
psychic sequels of..... 177
psychoanalytic introduction to a study of conduct disorders of 479
Encephalomyelomalacia chronica diffusa in four year old child. 405
Endocrine disorders, osseous development in 628
with mental symptoms..... 260
factor in electric excitability.. 518
therapy in combination with mental analysis 637
in mental deficiency..... 186
Engel, C. S. 518
Engelbach, Wm. 628
Etienne, G. 74
Epilepsy 644
administration of luminal in...*446
-like attacks in course of schizophrenia 636
spinal fluid pressure readings in 61
Epileptic, essential, further contribution to psychology of...*575
Evolution, national biological and psychological, from self-determination to mutual determination 294
Ewald, G. 639
Exophthalmic goiter, myasthenia gravis in 501

FABER, K. 309
Facial diplegia in neoarsphenamin polyneuritis *352
nerve, reservation of in radical treatment of parotid tumors 630
False prophets 203
Falta, W. 274
Famine sufferers, psyche of..... 642
Farnell, Frederic J. *553
Fear, effect of on menstruation.. 72
Feeblemindedness, commonwealth of Massachusetts research on causes of 64
Feeling and knowledge..... 646
of being followed, origin of... 527
Ferrand, W. 401
Ferree, C. E. 512
Ferreri, G. 632
Fibrillary neuroglia, staining of.. 178
Fibromyxoma of peripheral nerve 516
Filipinos, diabetes mellitus among 270
Finsen light, treatment of eczema and neurodermatitis with.... 266
Fischer, Bernh 647
Flower, J. C. 424
Foix, Ch. 626
Folsom, R. T. 154
Forbes, A. 395
Ford, W. W. 93
Forel, O. L. 305
Foss, H. L. 643
Foster 393
Fox, Howard 84, 265
Frank 642
Freeman, W. 178
Frets, G. P. 637
Freud, S. 528, 541
Freud's theory of wit..... 424
Friedman, G. A. 503
Friedreich's ataxia, abortive type of 149
Fry, Clem C. 262
Funsten 627

GANGRENE and sclerodema. 71
Ganter, G. 498
Garrison, F. H. 246
Gartje, E. 266

Gasbarrini 520
Gastrointestinal conditions, roentgenologic observations of associated with mental disorders 533
Gaupp, R. 537
Genius and insanity 193
George, W. E. 405
Gersternberger, H. J. 634
Gillespie, R. D. 412
Gillis, James S. 203
Glassburg, John A. *17
Glaucoma simplex, hereditary 80
Glioma, diffuse *343
Globus, J. H. 617, 620
Glycosuria 172
Goiter, exophthalmic, myasthenia gravis in 501
operation, unilateral, tetany after 508
relationship of to mental disorders 643
Gold, H. 80
Goldberg, B. 509
Goldberger, M. A. 77
Goldenberg, P. 623
Gordon, A. 623
Gôrriz, M. 500
Gotta, H. 77
Gottesman, J. 503
Grant, R. T. 268
Grasmann, M. and K. 508
Gray, S. 71
Greenfield, J. G. 195, 501
Gregg, Donald 62
Greig, J. Y. T. 424
Griffith, F. R., Jr. 395
Grimberg. L. 156
Groddeck, G. 418
Gross, E. G. 507
Grossman, M. 613
Guillain, Georges 202
Guizzetti, P. 645

HABIEN, H. C. 92
Haeberlin, Carl 645
Hahn, F. 403
Haines, T. H. 622
Hajek, K. 519
Halbertsma 189
Hallucinatory psychoses, chronic. 640
sensation, paraphrenia systematic with ten forms of . . . 642
Hallucinosis in syphilitics 398
Hamburger, W. W. 533
Hamilton, W. F. 511
Hammett, F. S. 626
Hannon, R. R. 272
Harbitz, F. 286
Hassin, George B. 183, *352
Hauser 404
Health, personal and community. 311
Heile 517
Hellpach, W. 190
Hemiplegia and urticaria 268
Hemorrhage, subarachnoid 613
Henderson, D. K. 412
Henner, K. 501
Henry, A. 165
Henry, G. W. 533
Heredo-degenerations 641
Hermaphrodism 73
Hermaphroditism, cases with especial consideration of the interstitial cells 168
Hermel, H. 405
Herpes, inoculation of in encephalitis 522
labialis 634
zoster 519
and chickenpox 636
and varicella 633
etiology of 68
relief of pain by paraffin 84
with localized muscular paralysis 623
with motor disturbances 520
with motor paralysis 634
Herpetic stomatitis 634
Herpetiform eruptions in encephalitis lethargica 524
Herrenschwand, F. v. 165
Heterochromia, sympathetic 165
Heveroch, A. 288
Heyer, G. R. 205
Heyman, C. H. 628
Higgins 505
Hinkle, B. 418
Hirsh-Kauffmann, H. 622
Histology, Bailey's text-book of . . 197
History and psychology 312
Hoch, August 531
Hoch, Theodore A. 288
Hoffman, F. L. 505
Hoffmann, H. 87
Hohman, Leslie B. 283
Holland 182
Holmgren, I. 179
Holst, J. E. 285
Holst, P. F. 309
Homosexuality, neurotic mechanism in 528
Horn, W. 166
Hübner 300
Human constitution, relationship to disease 307
mind and ancient idea of consciousness *433
Hunt, J. Ramsay 279
Huntington and migraine 623
Hydrophobia vaccination, nervous disturbances after 519
Hyman, A. 185
Hypernephroma with tuberous brain sclerosis and adenoma sebaceum 185

Hypnotism 88
Hypoglycemic reactions and vagotonia *457
Hypomania, therapeutic use of dehydration in 62

IDIOCY, amaurotic, birth control in families with 186
amaurotic family 187
mongoloid, in twins 189
Imagination and emotion 426
Infantile progressive muscular atrophy of Werdnig-Hoffman type 500
Influenza meningitis 404
Innervation, autonomic, and a nonfatigability of voluntary muscle 498
triple motor, of striped muscles 622
Innervations, double, of mesodermal muscle 499
Insane, criminal, intelligence of . . 288
treatment of in former centuries 536
Insanity and crime 304
and genius 193
Insulin, effects of on diabetes dogs 172
in rabbits 504
source of 275
Internal medicine, text-book of . . 309
Intoxications, infantile, nervous complex in 90
Intraspinal therapy 183
Inversions from standpoint of reflexology 643
Involution melancholia, prognosis of 531
Itching 167
Iwabuchi, T. 506

JACKSON, J. A. 643
Jackson, J. Hughlings 540, 647
Jakob, A. 406
Janet, Pierre 412
Jarrett, R. F. 642
Jealousy, neurotic mechanism in. 528
Jelgersma, H. C. 422
Jelliffe, Smith Ely . . . *357, *467, *592
Joel, E. 289
Johnson, Alice E. 188
Joslin, Elliott P. 172
Jourdanet, P. 166
Jurisprudence and sexual constitution 300
Juster 265

KAPPERS, C. U. Ariëns 545
Kastan 537
Katz, D. 180
Kehrer, F. 88, 510
Kelley, C. M. 528
Kelsen, Hans 419
Kennedy, Foster 153, 525, 626
Kerlin, W. S. 524
Kerr, D. 401
Keussler, H. v. 168
Key 90
Kinesia, paradoxic postencephalitis 173
Kistner, Frank B. 277
Klauder 399
Kleist 641
Klemperer, P. 506
Knox, Leila C. 372
Kollarits, Jenö 292, 294, 526
Koskinas, G. N. 542
Krabbe, K. H. 518
Kraepelin, Emil *209
Kreis, L. 73
Kretschmer, E. 527
Kreuter 76
von Kries, Johannes 425
Kroner, K. 167

L'ABBÉ 170
Labyrinthine tests in cerebellar diagnosis 277
Labyrinthitis, plastic, of congenital luetic origin 510
Lafora, G. R. 402
Lameness, intermittent 624
Landauer, K. 507
Langelaan, J. W. 624
Langley, J. N. 517
Laryngeal abductors, bilateral paralysis of 82
localizations 195
Laurens, Henry 511
Lead poisoning 92
Leahy, S. R. 87
Lefthandedness 646
Legrain 68
Leichtentritt, B. 90
Lennox, Wm. G. 61
Lépine, J. 634
Léri, A. 70
Lermoyez 268
LeRossignol, W. J. 192
Levi, Paul *446
Levy, Gabrielle 302
Lévy-Franckel 265
Lévy-Valensi, J. 196
Lewis, Sinclair 203
Lewis, T. 268
Light, cause of urticaria 267
effects of on organism 69
Linell, E. A. 516
Lipodystrophia progressiva 70
Lipschutz, B. 68
Loewi, O. 178
Lomholt, S. 266
Lortat-Jacob 68
Löwy, R. 406
Luckhardt, A. B. 509
Luetic origin of plastic labyrinthitis 510

Lugiato, Luigi 202
Lumbago and sciatica 84
Luminal, administration of in epilepsy *446
Lurie, L. A. 644

MAC CURDY, John T. 531
Mackenzie, G. W. 78
Macleod, J. J. R. 275
MacNalty, A. S. 173
MacWilliam, J. A. 189
Malaria in treatment of general paresis 253
Man, his making and unmaking.. 426
Manic-depressive psychosis..... 644
Marañon, G. 504
Marburg, O. 278
Marinesco, M. G. 76
Marken Island, Holland, peculiar custom on 422
Marsh, P. L. 275
Martius, F. 180
Mayer, C., basal joint reflex of.. 180
McCann, W. S. 272
McCarthy, Daniel J. 532
McGuire, E. R. 86
McMahon, Alphonse..... 628
Median nerve, sarcoma of..... 86
Medicine, mental measurement in relation to 89
Medow, W. 642
Meiné, F. 267
Melancholia, involution 531
Melanesia, sacred money in..... 416
Menge, Edward J. 301
Meningitis, acute serous..... 406
aseptic, in combating problem of dementia precox..... 293
circumscribed serous 407
following spinal anesthesia.... 407
influenza 404
serous, ear tests in..... 632
tuberculous 405
tuberculous, is it curable?..... 408
Meningococcus B. sepsis..... 407
Menninger, William C. *58
Menorrhagia in young girls..... 71
Menstrual psychosis, castration in. 639
Menstruation, effect of fear on.. 72
vegetative nervous system in.. 73
Mental analysis, endocrine therapy in combination with..... 637
defect, hereditary and non-hereditary 187
deficiency and psychoneurosis.. 299
and syphilis 90
endocrine therapy in..... 186
derangement, organic states in. 535
disease, early recognition of tendencies to 536
problem 538
prognosis in 535
tuberculosis as causes of.... 87
Mental analysis—*Continued*
disorder and religious experience, relationship between. 409
associated with gastrointestinal conditions 533
relationship of goiter to..... 643
disturbances, inheritance of.... 641
hospital, review of service patients in 412
measurement in relation to medicine 89
pathology 202
symptoms, opportune appearance of in those accused of crime or facing a crisis in life... 91
with endocrine disorder..... 260
Mercury, idiosyncrasy to 267
Mesencephalic reflex reactions... 178
Mesodermal muscle, double innervations of 499
Metabolism, carbohydrate, and the pancreas 169
in psychoses..... 641
studies in tetany 506
Meyer, A. 428, 643
Michael, J. C. 500
Mignard, M. 535
Migraine and Huntington..... 623
Mills, A. E. 520
Mills, H. P. 622
Minkowski, E. *553
Minogue, S. J. 288
Moersch, Frederick P. *343
Money, sacred, in Melanesia..... 416
Mongoloid idiocy in twins..... 189
Moore, Irwin 82
Moore, J. Ross.....*569
Morgenstern. S. 532
Morin, P. 178
Morons, in Iowa, medico-psychological survey of..... 639
Multiple sclerosis, diathermia in treatment of 491
Murder, psychology of..... 311
Muscle extracts, creatinin and creatin in..... 626
mesodermal, double innervations of 499
neurotization of..... 622
tonus 624
skeletal, physiology and pathology of 502
Muscles, nonstriated, reaction of. 498
paralyzed, innervation of..... 635
progressive dystrophy of 502
striated, changes in in morbus Basedow 625
Muscular dystrophy..... 627
hypertrophy, postneurotic 518
Musculospiral palsy, excessive golf followed by 83
Mushroom poisoning 92

Myasthenia gravis in exophthalmic goiter 501
Mydriatic action of cocain, seat of 80
Myers, C. S. 299
Myerson, Abraham 64, 416
Myopathy, primary progressive.. 501
Myotonia 623
atrophic 501
congenita (Thomsen) 626
Myotonic dystrophic degeneration 510
Myotonica, dystrophia 501

NACCARATI, Sante *219
Neel, Axel V. *1
Neoplasm, brain..... 620
Nerve action, transmission of.... 178
branches, artificial, for innervation of paralyzed muscles... 635
lesions in early syphillis..... 183
roots, nerve-fiber constitution of 517
stimuli 395
substance and cancer, relation between 518
tissue, tumor of 83
Nervous complex in infantile intoxications 90
control of skin reactions..... 268
diseases 306
disturbances after hydrophobia vaccination 519
patient 301
system, changes in in Thomsen's disease 626
comparative anatomy of..... 545
constitution of cerebrospinal fluid in syphilis of..... 182
pathological anatomy of..... 645
surgery of..... 648
Netter, Arnold 524
Neuralgia, pernicious forms of and defective mental make-up 526
Neuritis 83
low sacral 85
Neurodermatitis, treatment of with Finsen light 266
Neuroglia, fibrillary, staining of. 178
Neurological diagnosis 196
fragments 540
studies 202
Neurology, electrochemical factor in 310
Neuro-ophthalmic studies of war injuries 633
Neuropsychiatric sequelae of acute epidemic encephalitis in school children 393
Neuropsychiatry in pediatrics.... 640
Neuroretinitis, case with recovery 478
Neuroses, in course of chronic lethargic encephalitis 153
traumatic 87
Neurosis, psychology of 305
Neurosyphilis 181, 182, 399
provocative reaction in c.s.f. in 399
treatment of 399, 403
tryparsamide in treatment of..*569
Neurotization of muscle..... 622
New York Neurological Society 149, 246, 372, 478, 612
Nicolesco, I. 626
Niderehe, W. 507
Nielsen, Johannes M. *456
Niessl von Mayendorf, E..... 311
Nishikawa, Y. 278
Nobécourt 275
Nonstriated muscles, reaction of. 498
Norman, H. J. 193
Norvig, J. 641
Nothmann, F. M. 622
Novak 168
Nunberg, H. 413

OBITUARIES:
Brill, Nathan E. 429
Cassirer, Richard 97
Golgi, Camillo 429
Ingenieros, José 206
Langley, John Newport..... 98
Mahaim, Albert 96
Polon, Albert 550
Rayner, Henry 549
Rhein, John Henry Wallace... 206
Stedman, Henry Rust..... 546
Tuczek, Franz 431
Ocular symptoms of epidemic encephalitis 393
Oedema, angino-neurotic 164
Oloff, H. 281
Organism, effects of light on.... 69
Organotherapy, ovarian 168
Organs, studies in transplantation of 72
Osler, Sir William, Life of..... 204
Osseous development in endocrine disorders 628
Otitic disease, psychoneuropathic complications of..... 631
Ott, W. O. 630
Ovarian organotherapy 168
origin of chlorosis 74

PALSY, musculospiral 83
Pancreas and carbohydrate metabolism 169
preparation in treatment of diabetes mellitus 275
Pancreatic hormone in diabetes.. 273
Paraffin, relief of pain in herpes zoster by 84
Paralysis after preventive treatment of tetanus..... 634
agitans and righting reflexes... 373
bilateral, of laryngeal abductors 82
infantile, paradoxical cerebral. 406

Paralysis agitans—*Continued*
localized muscular, with herpes zoster 623
motor, with herpes zoster 634
of scapular girdle 87
Paranoia, catamnesis contribution to theory of 537
confusional 288
neurotic mechanism in 528
Paraphrenia systematica with ten forms of hallucinatory sensation 642
Parathyroid hyperplasia and bone destruction in generalized carcinomatosis 506
tetany 507
Parathyroidectomized dogs, preservation of life of 509
Parathyroids, protection of 508
Pardee, Irving M. 372
Paresis and tabes, pathogenesis of 401
general *209
malaria in treatment of 253
present status of treatment of 199
Parhon, Constance 75
Parker, G. H. *135
Parker, H. L. 286
Parker, Sam *313
Parkinsonian bradykinesias, post-encephalic 522
Parotid tumors 630
Parson, Beauford Sims 646
Parsons, A. 173
Pasqué, Ernest H. 310
Pasteur 270
Pathogenesis of death from scalding 269
of trophic skin lesions 265
Pathology as natural science 648
vitalism in 647
Patients, discharged 294
Patterson, Harold A. *446
Pearson, G. H. J. 399
Pediatrics, neuropsychiatry in 640
Pellacani, G. 286
Pemphigus vulgaris and spinal cord 497
Perdrau, J. R. 173
Pérez, M. L. 504
Periarterial sympathectomy in treatment of scleroderma 166
Perinuclear spiral filament of striped muscle-fibers 500
Peripheral nerve, fibromyxoma of 516
injuries 514
nerve-fiber constitution of . . . 517
Péron, N. 70
Personality, psychopathic 531
unstable, with vivid imaginative and dramatizing powers 262
Perversions from standpoint of reflexology 643
Petrén, K. 309, 392
Pfeifer, Sigmund 423
Phrenic shoulder pain 516
Physiognomy, racial 190
Piccinino, F. 403
Pijper 90
Poetry and childhood 304, 540
Poisoning, lead 92
mushroom 92
Polák, E. 270
Poliomyelitis, acute 287
Polon, Albert 379
Polyneuritis, neoarsphenamin, facial diplegia in *352
Pontocerebellar angle studies 278
tumors of 278
Postencephalic Parkinsonian bradykinesias 522
respiratory disorders *357, *467, *592
behavior disorders 283
Postencephalitis kinesia, paradoxic 173
Pottenger, Francis Marion 425
Potter, H. W. 186, 187
Pregnancy, diabetes during 504
Price, George E. 284
Problem child 87
Proeschel, G. 636
Prophets, false 203
Pruritus, echo 166
pernicious forms of and defective mental make-up 526
Pseudo-hermaphrodism as cause of sterility 73
Pseudohermaphroditic cock 75
Pseudohermaphroditism 77
Pseudosclerosis, Westphal-Strümpell 281
Psychasthenic delirium 412
Psyche of famine sufferers 642
Psychiatry and psychoanalysis . . . 289
broadened interests of 416
clinical, and relation to psychopathological research 527
modern, character of *313
studies in 428
Psychic guidance of chronic and incurable patients 526
Psychoanalysis 427, 645
and psychiatry 289
and schizophrenia 638
outline of 302
spiritual significance of 418
Psychoanalytic introduction to a study of conduct disorders of lethargic encephalitis 479
Psychogenesis of confirmed stammerers *238
Psychogenic disturbances in a foreign language environment 538
Psychology and history 312
of essential epileptic *575
of industry 646
of murder 311

Psychology—*Continued*
of neurosis 305
of sorrow 292
of witnesses' testimony..... 189
old and new viewpoints in..... 196
social 303
state and social..... 419
Psychoneuropathic complications of otitic disease..... 631
Psychoneurosis and mental deficiency 299
Psychopathic inferior, constitutional 188
inheritance, psychopathology and theory of 535
personality 531
Psychopathological research and relation to clinical psychiatry 527
Psychopathology and theory of psychopathic inheritance 535
Bergson's conceptions as applied to *553
Psychoses, acute cardiac 533
with symptoms resembling dementia precox 288
classification of.....*586
hallucinatory 640
metabolism in..... 641
Psychosis, menstrual, castration in 639
simple reaction in..... 528
the patient with 410
Psychotherapy of bodily symptoms 197
Pupils in somatic and visceral disorders in association with deferred pain and hyperalgesia *105
pathology of 510

QUEEN MAB 423
de Quervain, F. 508

RABEAU 399
Racial physiognomy 190
Rademaker, G. G. J. 94
Rand, G. 512
Ravaut 399
Ray, L. H. 395
Raynaud's disease, case involving feet, left retina, and heart wall 81
Read, Chas. F. *352
von Recklinghausen's disease, case with spinal cord symptoms.. 636
Recktenwald 636
Red nucleus 94
Reflex, basal joint, of C. Mayer. 180
frontal, associated with certain cerebral lesions 179
reactions, mesencephalic 178
tonus 94
Reflexes, defense 179
righting, and paralysis agitans. 373
Reflexology, perversion and inversions from standpoint of. 643
Reiche, F. 404
Reisert, A. 169
Rejuvenescence and Steinach's operation 76
Religious experience and mental disorder, relationship between 409
Replogle, J. P. 86
Respiratory disorders, postencephalitic *357, *467, *592
rhythm and encephalitis..... 286
Retina, topographical representation of in primary optic centers 80
Rhomboideus minor muscle, sprains of 86
Ricker, Gustav..... 648
Riley, Henry Alsop..... 149
Rinné test 78
Ritterhaus, E. 644
Roberts, L. J. 634
Robertson, B. 164
Robertson, George M. 537
Roentgen ray versus vaccines in treatment of acne 265
Rôheim, Gâza 416
Rohr, F. 502
Rollier, A. 497
Rombold, Charles R. 149
Rosenbaum, S. 90
Rosental, S. 526
Rothacker, A. 70
Rothenberg, Simon *143
Roubinovitch, J. 640
Rüdin, E. 641
Runge, W. 282
Rutherford, H. R. C. 535

SACHS, Bernard 249, 383
Sachs, E. 186
Sacki, F. 508
Sacred money in Milanesia..... 416
Sacro-lumbar roots, avulsion of.. ...
changes due to avulsion of in chelonidae 635
Sahlgren, E. 407
Salan, Joseph 487
Salinsky, H. 617
Salmon, A. 173, 522
Salomonson, Wertheim 85
Salpetriere, The 246
Sand, K. 73
Sands, Irving J. 478
v. Sarbo, A. 522
Sarcoma of median nerve..... 86
Sargent, J. C. 400
Scalding, pathogenesis of death from 269
Scapular girdle, paralysis of..... 87
Scarlett, Hunter W. 633

Schilder, Paul, synthetic presentation of work of *313
Schizophrenia and psychoanalysis. 638
as psychic systemic disease.... 641
constructive formulation of.... 643
epilepsy-like attacks in course of 636
Schlesinger, H. 624
Schmid, F. 407
Schönberg, S. 187
Schou, H. J. 183
Schütz, H. 625
Schwabach test 78
Schwarz, O. 197
Sciatica and lumbago..... 84
operative treatment of..... 517
Scleroderma and gangrene..... 71
and syphilis 68
treatment of 70
by pariarterial sympathectomy 166
Sclerosis, tuberous brain, with hypernephroma and adenoma sebaceum 185
Scott, G. O. 399
Scottish asylum system, hospitalization of 537
Scripture, May Kirk *17
Seashore, Carl E. 639
Selling, Laurence 277
Sénèque, J. 636
Senile dementia and Alzheimer's disease 637
Sense organ physiology..... 425
Sensory activities of skin for touch and temperature..... 167
Serra, G. 622
Service patients in mental hospital, review of 412
Sessions, M. A. 622
Sexual constitution and jurisprudence 300
deviates, malformations in..... 75
glands and vitamin B..... 77
Sézary 70, 401
Shemeley, Wm. G., Jr. 510
Shinkle, Clyde E. 81
Siemerling, E. 281
Silver arsphenamin in syphilis... 403
Skeletal muscle tonus, physiology and pathology of..... 502
Skin lesions, trophic, pathogenesis of 265
reactions, nervous control of... 268
vascular reactions of to injury. 268
sensitiveness 270
sensory activities of for touch and temperature 167
Smeesters, E. 87
Snell, A. C. 80
Sodium ion, influence of in production of tetany..... 508
Solomon 399
Solomon, H. C. 253
Sorrow, biology and psychology of 292
Spalaikovitch 631
Spasmophilia, calcium in blood in 509
Spaulding, Edith R. 637
Specht, O. 518
Speech disorders, behavioristic attitudes caused by..... *17
Spiegel, E. A. 502
Spinal anesthesia, meningitis following 407
cord and brain diagnosis..... 203
and pemphigus vulgaris..... 497
compression *143
symptoms, case of von Recklinghausen's disease with.. 636
tumors *23, 196
diagnosis and treatment of. 392
fluid in epidemic encephalitis.. 394
pressure readings in epilepsy. 61
Spine, electropuncture of in tabes. 403
Spiritism, hypnotism and psychic disturbance 88
Spradling, R. H. 410
Sprunt, T. P. 70
Stahl, O. 648
Stammerers, psychogenesis of...*238
Stärcke, A. 289
Starr, M. Allen..... 247
Stattmüller, K. 500
Stein, R. O. 68
Steinach operation, report of 22 cases with endocrine interpretation 73
Steinach's operation and rejuvenescence 76
Stephenson, Junius W. 491
Sterility, pseudo-hermaphrodism as cause of..... 73
Stiefler, G. 180
Stockard, C. R. 641
Stookey, Byron..... 635
Strauss, I. 620
Striocerebellar tremor..... 279
Strong, Oliver S. 197
Strümpell, Adolf..... 647
Stuurman, F. J. 534
Subarachnoid hemorrhage..... 613
Sugar content of blood and spinal fluid in epidemic encephalitis. 394
Suggestion 424
Sullivan, W. C. 304
Sunlight, prophylactic and curative action of..... 497
Superstition and delusion..... 88
Surgery of vegetative nervous system 648
Suttie, I. D. 535
Sutton, Irwin C. *569
Sylvester, Reuel H. 89
Sympathectomy and bone atrophy. 628
Sympathetic and skin sensitiveness 270

Syphilis and mental deficiency.. 90
and scleroderma..... 68
congenital, cerebrospinal fluid in..... 400
early, nerve lesions in..... 183
nervous, treatment of by subcutaneous injection of arsenical compounds 181
of nervous system, constitution of cerebrospinal fluid in..... 182
silver arsphenamin in..... 403
Syphilitics, hallucinosis in..... 398
Szymanski, J. S. 646

TABES and paresis, pathogenesis of..... 401
early recognition and treatment of..... 402
electropuncture of spine in..... 403
juvenile..... 401
specific treatment of..... 401
visceral analgesia in..... 404
Tabetic ataxia, pathogenesis of.. 402
Teissier..... 522
Testicle implants..... 76
Tetania gravidarum..... 507
Tetanoid..... 507
Tetanus, paralysis after preventive treatment of..... 634
Tetany, after unilateral goiter operation..... 508
influence of sodium ion in production of..... 508
metabolism studies in..... 506
parathyroid..... 507
postoperative..... 508
sudden death in..... 506
Tezner..... 400
Thalhimer, W. 394
Thomsen's disease..... 500
changes in nervous system in. 626
Thyroid, internal pancreatic function of and diabetes..... 503
relation of to pancreatic diabetes in dogs..... 503
Tilestone, W. 506
Tilney, F. 276
Tinnitus, pernicious forms of and defective mental make-up.... 526
Tisdall, F. F. 508
Tixier..... 181
Torrance, H. W. 187
Torticollis, pernicious forms of and defective mental make-up 526
Toxemia, case of..... 612
of severe superficial burns..... 164
Tramer, N. 638
Transvertitism..... 187
Traumatic neuroses..... 87
Tremor, striocerebellar..... 279
Trophedema..... 70
chronic acquired..... 165
Tryparsamide in treatment of late neurosyphilis..... *569
Tuberculoma of dura..... *23
Tuberculose en plague with pathological specimen..... 372
Tuberculosis as causes of mental disease..... 87
Tuberculous meningitis..... 405
is it curable?..... 408
Tumor, brain, metastatic..... 617
of nerve tissue 83
Tumors, facial nerve in radical treatment of 630
of pontocerebellar angle..... 278
parotid, reservation of facial nerve in radical treatment.. 630
spinal cord *23, 196
diagnosis and treatment of. 392
Turner, Clair Elsmere..... 311
Twins, identical, dementia precox in..... *135
mongoloid idiocy in..... 189

UNCONSCIOUS mechanisms. 195
Underhill, F. P. 506, 507
Unilateral Argyll-Robertson pupil, with presence of consensual reaction in both eyes.... *58
Unlicensed institutions, resolutions regarding right of physicians to treat mental cases in..... 383
Updegraff, H. 394
Uramoto, S. 88
Urticaria and hemiplegia..... 268
caused by light..... 267
chronic..... 164

VACCINES versus roentgen ray in treatment of acne.... 265
Vagotonia and hypoglycemic reactions..... *457
Vallery-Radot.....265, 270
Van Ophuijsen..... 527
Van Teslaar, J. S. 302
Varicella and herpes zoster..... 633
Vasconcelos, A. Brioso..... 403
Vascular reactions of skin to injury..... 268
Vaucher, E. 407
Vedsmand..... 501
Vegetative disturbances in post-encephalitic syndromes and their relationship to diencephalic and mesencephalic lesions. Changes in basal metabolism..... *219
nervous system in menstruation. 73
Veiel, W. H. 169
Veraguth, O. 83
Vibration sense, nature of..... 180
Viers, R. S. 187
Villaverde..... 398

Vincent, C. 523
Visceral analgesia in tabes..... 404
disease, symptoms of..... 425
Viscero-cutaneous anaemic zones. 166
Vitalism in pathology..... 647
Vitamin B and sexual glands.... 77
Voluntary muscle, nonfatigability of and its autonomic innervation..... 498
Voronoff, S. 72

WAGNER, case of..... 537
Wallin, J. E. Wallace... 307
Wallis, R. L. M. 275
Wanke, Georg..... 427
Wassermann control..... 400
Waterston, D. 167
Weber test..... 78
Wechsler, I. S. 373
Weinberg, Max H. *23
Weiss, S. 626
Wells, F. L. 528
Werdnig-Hoffman type of muscular atrophy..... 500
Wernoe, T. B. 166
Wertheimer, P. 407
Wesselink..... 73
Westphal-Strümpell pseudo-sclerosis..... 281
Weygandt, W. 189
White, Wm. A. 410
Wholey, C. C. 83
Wimmer, A. 87
Winther, K. 177
Wishfulfillment in earthly and divine punishments..... 418
Wit, Freud's theory of..... 424
Worster-Drought, C. 623
Wright, Jonathan.....*433

YOGA, physiologic study of... 88

ZAHN, K. A. 509
Zeiner-Henriksen, K. 520
Ziehen, Th. 308

JO Psychol

N. B.: See Index of Journal of Nervous and Mental Disease: Vols. 1-50
Just prepared: See page IX

Vol. 63 JUNE, 1926 No. 6

The Journal OF Nervous and Mental Disease

AN AMERICAN JOURNAL OF NEUROPSYCHIATRY

FOUNDED IN 1874

THE LIBRARY OF THE
JUN 19 1926
UNIVERSITY OF ILLINOIS

MANAGING EDITOR
DR. SMITH ELY JELLIFFE
64 West 56th St., New York

ASSOCIATE EDITORS
WILLIAM A. WHITE, M.D., and GREGORY STRAGNELL, M.D.
372-374 Broadway, Albany, N. Y.

WITH COLLABORATION OF

DR. C. L. ALLEN, Los Angeles, Calif.
DR. C. E. ATWOOD, New York, N. Y.
DR. LEWELLYS F. BARKER, Baltimore, Md.
DR. B. BROUWER, Amsterdam, Holland
DR. CARL D. CAMP, Ann Arbor, Mich.
DR. C. MACFIE CAMPBELL, Boston, Mass.
DR. LOUIS CASAMAJOR, New York, N. Y.
DR. L. PIERCE CLARK, New York, N. Y.
DR. HARVEY CUSHING, Boston, Mass.
DR. FREDERIC J. FARNELL, Providence, R.I.
DR. BERNARD GLUECK, New York, N. Y.
DR. MENAS S. GREGORY, New York, N. Y.
DR. C. JUDSON HERRICK, Chicago, Ill.
DR. GORDON HOLMES, London, Eng.
DR. J. RAMSAY HUNT, New York, N. Y.
DR. C. ARIËNS KAPPERS, Amsterdam, Holland
DR. EDW. J. KEMPF, New York, N. Y.
DR. GEO. H. KIRBY, New York, N. Y.
DR. ADOLF MEYER, Baltimore, Md.
DR. L. J. J. MUSKENS, Amsterdam, Holland
DR. GEO. H. PARKER, Cambridge, Mass.
DR. E. A. SHARP, Buffalo, N. Y.
DR. GREGORY STRAGNELL, New York, N. Y.
DR. OLIVER S. STRONG, New York, N. Y.
DR. E. W. TAYLOR, Boston, Mass.
DR. WALTER TIMME, New York, N. Y.
DR. FRED W. TILNEY, New York, N. Y.
DR. WM. A. WHITE, Washington, D. C.
DR. S. A. K. WILSON, London, England

Presenting Reports of the
AMERICAN NEUROLOGICAL ASSOCIATION, AMERICAN PSYCHIATRIC ASSOCIATION, NEW YORK NEUROLOGICAL SOCIETY, NEW YORK PSYCHIATRICAL SOCIETY, BOSTON SOCIETY OF PSYCHIATRY AND NEUROLOGY, ETC.

SERIAL NO. 534

TABLE OF CONTENTS ON PAGE II

2 VOLS. PER YEAR

ISSUED MONTHLY $1.00 PER COPY $10.00 PER YEAR

FOREIGN SUBSCRIPTION $11.00 PER YEAR

Entered as second-class matter at the Post Office at Albany, New York, March 30, 1922. Copyright by Smith Ely Jelliffe, M.D., Publisher, 1926

N. B.: Consult Our Directory of America's Leading Sanitaria

H. K. LEWIS, 136 Gower Street, London, W. C. Steiger & Co., 49 Murray Street, New York. G. Stechert & Co., 31 East 10th Street, New York. Paul B. Hoeber, 69 East 59th Street, New York. Chicago Medical Book Co., Chicago, Illinois.

N. B.: See Index of Journal of Nervous and Mental Disease: Vols. 1-50
Just prepared: See page IX

LIQUID
POWDER
OINTMENT

CAMPHO-PHENIQUE

LIQUID
POWDER
OINTMENT

CAMPHO-PHENIQUE POWDER

ANTISEPTIC DRY DRESSING.

PHYSICIANS!—A trial in your next case will convince you of its merits.

℞ Dust the Powder directly over the affected part and cover with a bandage in the following cases:

Lacerated Wounds, Burns, Scalds, Syphilitic Ulcers, Gunshot Wounds, Chancres, Suppurating Skin Lesions and in various forms of Minor Surgery.

Literature and Samples on request.

Always specify original package.

CAMPHO-PHENIQUE COMPANY
St. Louis, Mo., - U. S. A.

Verlag von Julius Springer in Berlin W. 9

Die Erkrankungen des Nervensystems

Zweite Auflage bearbeitet von

G. v. Bergmann, E. Billigheimer, R. Bing, O. Bumke, H. Curschmann, K. Goldstein, Ernst Meyer, Eduard Mueller, M. Nadoleczny, O. Veraguth, K. Wittmaack

Erster Teil:

1086 Seiten mit 431 zum Teil farbigen Abbildungen.
1925 In Leinen gebunden 69 Rm.

Zweiter Teil:

540 Seiten mit 112 Abbildungen. 1925 In Leinen gebunden 33 Rm.
(Bildet Band V des Handbuches der inneren Medizin. Zweite Auflage. Unter Mitarbeit von zahlreichen Fachgelehrten herausgegeben von Prof. Dr. G. v. Bergmann und Prof. Dr. R. Staehelin.)

PARKE, DAVIS AND COMPANY

RABIES VACCINE

(Cumming)

THE importance of preventing rabies is fully appreciated by the medical profession for the reason that not a single cure of a well authenticated case of human rabies has ever been reported.

The prompt employment of Rabies Vaccine is imperative for the safety of the patient. Rabies Vaccine (Cumming), P. D. & Co., is a product that represents the antigenic principle of rabies virus, but since it contains no living virus it can be administered without risk of precipitating an attack of rabies. The doses are not numbered, for they are all alike; 2 cc. of a harmless vaccine by hypodermic injection; no more exacting technique than that.

Rabies Vaccine (Cumming), P. D. & Co., is made by the method devised by Dr. J. G. Cumming. A one per cent suspension of rabic brain tissue (from rabbits dying of rabies induced by an injection of fixed virus) is dialized against running distilled sterile water until the infectivity of the virus is destroyed. The safety of the finished product is assured by injections beneath the dura of rabbits and subcutaneously in guinea-pigs and mice. Sterility tests are also utilized to insure freedom from bacteria. The vaccine is standardized by weight so that 2 cc. of suspension, the contents of one of the syringe containers, contains sufficient material for one injection for an adult.

The safety and efficiency of Rabies Vaccine (Cumming), P. D. & Co., has been amply demonstrated by its employment in at least ten thousand cases of bites from rabid animals. The usual treatment consists of twenty-one injections—one injection daily for three weeks. A shorter course—one of fourteen injections only—suffices when the wound is only a slight scratch on the hands or lower limbs.

Rabies Vaccine (Cumming), P. D. & Co., is supplied in packages of seven 2-cc syringe containers, complete, with needles, each syringe holding one dose. Orders for a 21- or 14-dose treatment should be sent direct to Detroit (the home office) or the nearest branch or depot.

PARKE, DAVIS & COMPANY

(U. S. License No. 1 for the Manufacture of Biological Products)

DETROIT, MICHIGAN

RABIES VACCINE (CUMMING), P. D. & CO., IS INCLUDED IN N. N. R. BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION

TABLE OF CONTENTS

ORIGINAL ARTICLES

Bergson's Conceptions as Applied to Psychopathology. By Dr. E. Minkowski. Authorized Translation by Frederic J. Farnell, M.D., F.A.C.P. 553

Tryparsamide in the Treatment of Late Neurosyphilis. By J. Ross Moore, M.D., and Irwin C. Sutton, M.D. 569

A Further Contribution to the Psychology of the Essential Epileptic. By L. Pierce Clark, M.D. 575

On the Classification of the Psychoses. By Leland B. Alford, M.D. 586

Postencephalitic Respiratory Disorders. Review of the Syndromy, Case Reports and Discussion (Continued from page 477). By Smith Ely Jelliffe, M.D., Ph.D. 592

SOCIETY PROCEEDINGS

New York Neurological Society 612

A Case of Toxemia Presenting Unusual Clinical Manifestations, with Recovery; Subarachnoid Hemorrhage; Metastatic (Secondary) Brain Tumor; Pathological Material. Three Cases of Primary Brain Neoplasm.

CURRENT LITERATURE

I. VEGETATIVE NEUROLOGY

1. **Vegetative Nervous System:** Serra, G., Neurotization of Muscle (622); Mills, H. P., Haines, T. H., and Sessions, M. A., Familial Muscular Dystrophy; Six Cases in One Family (622); Nothmann, F. M., and Hirsh-Kauffmann, H., Triple Motor Innervation of Striped Muscles (622); Benedek, L., and Goldenberg, P., Huntington and Migraine (623); Worster-Drought, C., Herpes Zoster with Localized Muscular Paralysis (623); Gordon, A., Myotonia (623); Schlesinger, H., Intermittent Lameness (624); Langelaan, J. W., On Muscle Tonus. De Boer's Experiment on the Frog (624); Schütz, H., Changes in the Striated Muscles in Morbus Basedow (625); Hammett, F. S., Creatinin and Creatin in Muscle Extracts. V. Comparison of Rate of Creatinin Formation from Creatin in Extracts of Brain and Muscle Tissue (626); Weiss, S., and Kennedy, F., Clinical Experiments in Myotonia Congenita (Thomsen); Parasympathic Nervous System (626); Foix, Ch., and Nicolesco, I., Changes in the Nervous System in a Case of Thomsen's Disease (626); Funsten, Clinical Study of Thirty Cases of Muscular Dystrophy (627); Heyman, C. H., Bone Atrophy and Sympathectomy (628); Engelbach, Wm., and McMahon, Alphonse, Osseous Development in Endocrine Disorders (628).

II. SENSORI-MOTOR NEUROLOGY

1. **Cranial Nerves:** Adson, A. W., and Ott, W. O., Reservation of the Facial Nerve in the Radical Treatment of Parotid Tumors (630); Spalaikovitch, Psychoneuropathic Complications of Otitic Disease (631); Ferreri, G., Ear Tests in Serous Meningitis (632); Scarlett, Hunter W., Some Neuro-Ophthalmic Studies of War Injuries (633).
2. **Peripheral Nerves:** Condat, Herpes Zoster and Varicella (633); Gerstenberger, H. J., Etiology and Treatment of Herpetic Stomatitis and Herpes Labialis (634); Bloedorn, W. A., and Roberts, L. J., Herpes Zoster with Motor Paralysis (634); Lépine, J., Paralysis After Preventive Treatment of Tetanus (634); Stookey, Byron, Artificial Nerve Branches for Innervation of Paralyzed Muscles (635); Bignami, G., Changes Due to the Avulsion of the Sacro-Lumbar Roots in Chelonidae (635); Sénèque, J., Mechanical Injury of Brachial Plexus (636); Proeschel, G., A Case of von Recklinghausen's Disease, with Spinal Cord Symptoms (636); Netter, A., Herpes Zoster and Chickenpox (636).

III. SYMBOLIC NEUROLOGY

3. **Psychoses:** Recktenwald, Epilepsy-like Convulsive Attacks in the Course of Schizophrenia (636); Spaulding, Edith R., Endocrine Therapy in Combination with Mental Analysis (637); Frets, G. P., and Donkersloot, W. N., Senile Dementia and Alzheimer's Disease (637); Tramer, N., Psychoanalysis and Schizophrenia (638); Bickel, H., Affective and Intellectual Delusional Ideas (638); Ewald, G., Castration in Menstrual Psychosis (639); Seashore, Carl E., A Medico-Psychological Survey of Morons in Iowa (639); Roubinovitch, J., et al., Neuropsychiatry in Pediatrics (640); Claude, H., Chronic Hallucinatory Psychoses (640); Rüdin, E., Inheritance of Mental Disturbances (641); Kleist, Schizophrenias as Psychic Systemic Diseases (Heredodegenerations) (641); Norvig, J., Metabolism in Psychoses (641); Stockard, C. R., Alcohol Factor in Eliminating Racial Degeneracy (641); Medow, W., Clouding of Consciousness in Dementia Praecox (642); Frank, Psyche of the Famine Sufferers (642); Jarrett, R. F., Paraphrenia Systematica with Ten Forms of Hallucinatory Sensation (642); Bechterew, W., Perversions and Inversions from the Standpoint of Reflexology (643); Foss, H. L., and Jackson, J. A., Relationship of Goiter to Mental Disorders (643); Meyer, Adolph, Constructive Formulation of Schizophrenia (643); Lurie, L. A., The Subnormal and Psychopathic Child as Exemplified in Special Clinic (644); Ritterhaus, E., The Manic-Depressive Psychosis, Organic Brain Disease, and Epilepsy (644).

BOOK REVIEWS

Guizzetti, P., Anatomia Patologica del Sistema Nervoso Centrale (645); Haeberlin, Carl, Grundlinien der Psychoanalyse (645); Parson, Beauford Sims, Lefthandedness (646); Szymanski, J. S., Gefühl und Erkennen (646); Drever, James, The Psychology of Industry (646); Strümpell, Adolf, Aus dem Leben eines deutschen Klinikers (647); Jackson, Hughlings J., Eine Studie ueber Krämpfe. Uebersetzt von Otto Sittig, Prague (647); Fischer, Bernh., Vitalismus und Pathologie (647); Ricker, Gustav, Pathologie als Naturwissenschaft. Relationspathologie (648); Brüning, F., u. Stahl, O., Die Chirurgie des vegetativen Nervensystems (648); Liepmann, Wilhelm, Gynäkologische Psychotherapie (649); Garzella, Renata, L'Endocrinologia nei Rapporti Eziologica con le Dermatosi (649).

NOTES AND NEWS 650

GASTRON

Affords a means of fortifying and promoting gastric function

It is qualified for this clinical service by the fact that it is a complete gastric-gland extract, actually representative of the gastric-gland-tissue juice in all its properties and activities—activating, digestive, antiseptic.

GASTRON has found wide acceptance and use under the "considerate thought" and experience of the physician, to whom it is submitted.

FAIRCHILD BROS. & FOSTER
NEW YORK

"Promote natural bowel functions"

"In the treatment of constipation, I prefer **Prunoids** because they act promptly and well, without the griping or nausea common to other laxatives. They promote the natural functions and by giving tone to weakened bowel muscles, help to restore regular action."
—From a physician's report.

DOSE: One to two tablets as needed.

"It supports the weak, tired heart"

"There can be no doubt in the mind of any physician who will give Cactina Pillets a thorough trial, of their ability to support the weak, tired heart, control palpitation and strengthen its action. In my hands, Cactina has proven a very reliable heart tonic."
—From a physician's report.

DOSE: One to three Pillets, t. i. d.

Sultan Drug Company - St. Louis, Mo.

GUDE'S PEPTO-MANGAN

(LIQUID--TABLET FORM)

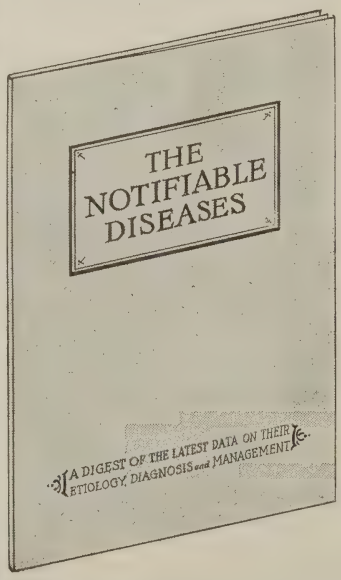
AN especially palatable and effective combination of ferruginous and manganic elements for the purpose of supplying the chlor-anemic patient with a readily assimilable and appropriable tonic. Gude's Pepto-Mangan has been prescribed for such patients for the last thirty-three years, and is an honest and straightforward remedy that can be depended upon to produce the results expected, when ordered in properly selected cases. Supplied only in 11 oz. bottles (liquid), and in tablet form 60 tablets to each package.

Literature, samples and further information from

M. J. BREITENBACH CO.

53 Warren Street New York City

The Notifiable Diseases



Their etiology, transmission, incubation period, diagnosis, duration, quarantine restrictions, and terminal disinfection.

Prepared under expert supervision, this timely booklet has been especially arranged to furnish the busy practitioner with a wealth of condensed information concerning the contagious diseases, that he cannot obtain elsewhere except at the cost of much time and effort.

If you would like to have a copy of this remarkably useful and attractively printed booklet, send in your request today with your professional card, and it will be sent free of all expense, by return mail.

If you wish to test **Gray's Glycerine Tonic Comp.** in some case of debility, malnutrition or convalescence after Grippe, Measles, Scarlet Fever and so on, a liberal sample is at your service.

THE PURDUE FREDERICK CO.

135 Christopher St., New York City

ERGOAPIOL (Smith)

Its Utility in the Treatment of

Amenorrhea, Dysmenorrhea and other Disturbances of Menstruation

Despite the fact that Ergoapiol (Smith) exerts a p onounced analgesic and sedative effect upon the entire reproductive system, its use is not attended with the objectionable by-effects associated with anodyne or narcotic drugs.

The unvariable certainty, agreeableness and singular promptness with which Ergoapiol (Smith) relieves the several varieties of amenorrhea and dysmenorrhea has earned for it the unqualified endorsement of those members of the profession who have subjected it to exacting clinica.

Dosage: Ordinarily, one to two capsules should be administered three or four times a day.

MARTIN H. SMITH CO.
NEW YORK, U. S. A.

JUST OUT—MONOGRAPH NO. 35

THE CONSTITUTIONAL FACTORS IN DEMENTIA PRECOX

WITH PARTICULAR ATTENTION TO THE CIRCULATORY SYSTEM AND TO SOME OF THE ENDOCRINE GLANDS. An Anatomic Study.

By NOLAN D. C. LEWIS, M.D.,
Clinical Psychiatrist, Saint Elizabeths Hospital, Washington, D.C.

25 full page illustrations Price $3.00

NERVOUS & MENTAL DISEASE PUBLISHING CO.
3617 Tenth St., N. W., Washington, D. C.

"Superior to other bromide preparations"

"After clinical tests I have found **Peacock's Bromides** superior to any other bromide preparation on the market, both in its immediate action and its after effects. No matter how long or continuously I have given it, it has never upset the digestion, or produced bromism."
—M. D., New York City.

DOSE: *One to three teaspoonfuls p. r. n.*

"When the liver is inactive"

"For many years I have relied on **Chionia** as my favorite cholagogue. I know of no other remedy that gives more prompt and uniformly satisfactory results when the liver is inactive or congested. It increases the flow of bile without cathartic action."
—M. D., New York City.

DOSE: *One to two teaspoonfuls t. i. d.*

Peacock Chemical Company - St. Louis, Mo.

MILWAUKEE SANITARIUM

Wauwatosa, Wisconsin (Chicago Office—1823 Marshall Field Annex —Wednesdays, 1-3 P.M.)

Maintaining the highest standards over a period of forty-two years, the Milwaukee Sanitarium stands for all that is best in the care and treatment of nervous disorders. Photographs and particulars sent on request.

Resident Staff
ROCK SLEYSTER, M.D., Med. Dir.
WILLIAM T. KRADWELL, M.D.
MERLE Q. HOWARD, M.D.

Attending Staff
H. DOUGLAS SINGER, M.D.
ARTHUR J. PATEK, M.D.

Consulting Staff
WILLIAM F. LORENZ, M.D.
RICHARD DEWEY, M.D. (Emeritus)

COLONIAL HALL—
One of the Eight Units in "Cottage Plan"

SPRING HILL SANITARIUM

HASTINGS-ON-HUDSON

18 miles from Grand Central Station, N. Y. City. A private sanitarium for mental and nervous diseases. built and equipped especially for such cases. Approved diagnostic and therapeutic methods. Spacious and attractive grounds. Accommodations, nursing, table—all first-class. Daily medical attention, massage, electricity and hydro-therapy. Single rooms, rooms with baths, or complete suites.

Dr. D. W. McFarland, Med. Dir. **Dr. G. F. Washburne, Assoc.**

CHANNING SANITARIUM, INC.

(Established in Brookline, 1879)
Has been transferred to Wellesley Avenue
WELLESLEY, MASS.

Seven new buildings on fifty acres of high woodland. Sleeping porch and private bath for each patient. Large and small suite cottages. Separate buildings for men and women. Facilities for occupation and diversion. Complete equipment for Vichy, Nauheim and Electric Baths and other forms of Hydrotherapy.

Clifford G. Rounsefell, M.D.
Resident Physician

Donald Gregg, M.D.
Superintendent

Belle Mead Farm Colony and Sanatorium

Belle Mead, New Jersey

For insane, senile and nervous patients, alcoholic and drug addicts: also selected cases of feeble minded and epilepsy. Country, 42 miles from New York City and Philadelphia. Reasonable rates for excellent accommodations and scientific treatment.

Five Attractive Buildings

Under State License

For rates and detailed information, address the Resident Physician, or New York City office, 666 Madison Ave. Hours 3-4 daily.

JUST OUT

MONOGRAPH No. 40

The Development of Psychoanalysis

By S. FERENCZI and O. RANK

PRICE $2.00

NERVOUS & MENTAL DISEASE PUBLISHING CO.,
3617 Tenth Street, N. W.
Washington, D. C.

JUST OUT

MONOGRAPH No. 41

Studies in Psychiatry
Vol. II

By the NEW YORK PSYCHIATRICAL SOCIETY

PRICE $3.00

NERVOUS & MENTAL DISEASE PUBLISHING CO.,
3617 Tenth Street, N. W.
Washington, D. C.

JUST OUT

MONOGRAPH No. 39

The Emotions, Morality and the Brain

By C. v. MONAKOW of Zurich

PRICE $2.00

NERVOUS & MENTAL DISEASE PUBLISHING CO.,
3617 Tenth Street, N. W.
Washington, D. C.

JUST OUT

Monograph No. 36

THE PRIMITIVE ARCHAIC FORMS OF INNER EXPERIENCES AND THOUGHT IN SCHIZOPHRENIA

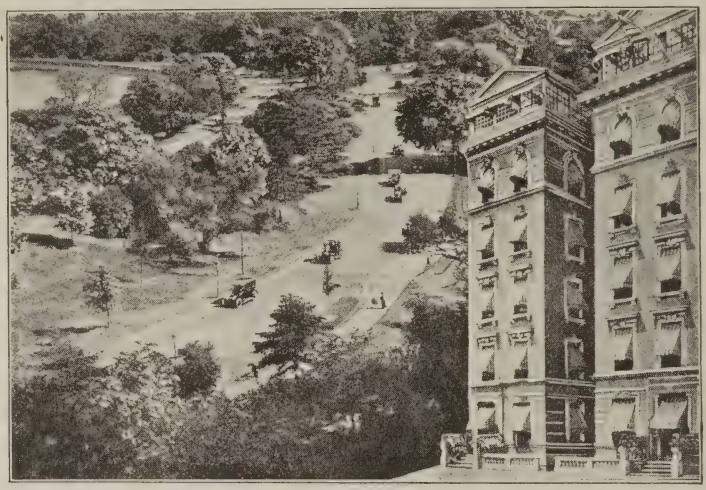
A Genetic and Clinical Study of Schizophrenia

By
ALFRED STORCH, M.D.

A scholarly argument for the necessity, in psychiatry, of supplementing the facts ascertained through the descriptive method by a comparison with the data furnished by genetic psychology. Illustrated and elaborated by a careful analysis of the process of thinking in schizophrenia.

Price $2.00

NERVOUS AND MENTAL DISEASE PUBLISHING CO.
3617 10th St., N. W., Washington, D. C.



CHARLES B. TOWNS HOSPITAL

293 Central Park West New York, N. Y.

For Alcohol and Drug Addicts

Provides a definite eliminative treatment which obliterates craving for alcohol and drugs, including the various groups of hypnotics and sedatives.

Complete department of physical therapy. Well equipped gymnasium. Located directly across from Central Park in one of New York's best residential sections.

Any physician having an addict problem is invited to write for "Hospital Treatment for Alcohol and Drug Addiction" or reprint referring to methods used at this institution.

BOOKS RECEIVED FOR REVIEW

Psychologische Studien am Geruchssinn: *H. Henning,* Urban & Schwarzenberg, Berlin

The Human Worth of Rigorous Thinking: *C. J. Keyser,* Columbia Univ. Press, N. Y.

Modern Medicine: Volume III, Lea & Febiger, Philadelphia

The Doctor Looks at Biography: *J. Collins,* Geo. H. Doran Co., New York City

Reluctantly Told: *Jane Hillyer,* Macmillan Co., New York City

Nervous and Mental Disorders: *B. Sachs, L. Hausman,* P. B. Hoeber, New York City

The Riddle of Society: *Chas. Platt,* E. P. Dutton, New York City

Gustav Theodor Fechner: *I. Hermann,* Int. Psa. Verlag, Wien

Die Biologie der Person, Lieferung 1 and 2: *Th. Brugsch, F. H. Lewy,* Urban & Schwarzenberg, Berlin

Psychologie der Weltanschauungen: *K. Jaspers,* J. Springer, Berlin

Psychotherapie: *Max Isserlin,* J. Springer, Berlin

Die Bedeutung der Roten Kerne und des Ubrigen Mittelhirns fur Muskeltonus, Korperstellung und Labyrinthreflexe: *G. G. J. Rademaker,* J. Springer, Berlin

Havelock Ellis: *I. Goldberg,* Simon & Schuster, New York City

L'Hygiene Mentale: *Chas. Bost,* Lib. Fischbacher, Paris

La Psychotherapie Religieuse: *S. Lortsch,* Lib. Fischbacher, Paris

The Blind Goddess: *A. Train,* Chas. Scribner's, New York City

L'Hygiene Mentale et Nerveuse Individuelle: *H. Bouyer, Martin-Sisteron,* A. Maloine, Paris

Diagnostica delle Malattie Sistema Nervoso: *G. Fumarola,* L. Pozzi, Rome

Seelische Ursachen und Behandlung der Nervenleiden: *I. Erhard,* Herder & Co., Freiburg

Uber die Wechselbeziehungen Zwischen Psychischen und Vegetativen Funktionen: *W. R. Hess,* O. Fussli, Zurich

Solarson

Trademark Reg. U. S. Pat. Off.

Brand of CHLORARSENOL

Injectable Arsenical Tonic and Alterative

Besides being entirely free from this objectionable feature of the cacodylates, Solarson is more uniform and reliable in action, as shown by the results in

Anemia *Malaria*
Chlorosis *Neuroses*
Dermatoses *Chorea*

WINTHROP CHEM. CO., Inc.
117 Hudson St., New York, N. Y.

No Garlicky Odor on the Breath

Supplied in 1.2 c.c. Ampules, Boxes of 10

Literature on Request

IMPORTANT NOTICE

Fifty Years of American Neurology

The first 50 volumes of the Journal of Nervous and Mental Disease have been indexed for subjects.

A complete history of American Neurology can be here obtained.

Limited number of copies printed

PRICE $10.00

Journal of Nervous and Mental Disease
64 West 56th Street New York City

Just Out **Monograph No. 42**

PSYCHOANALYSIS AND GENERAL PARESIS

By O. HOLLOS and P. FERENCZI

PRICE $1.50

NERVOUS & MENTAL DISEASE PUBLISHING CO.

3617 Tenth St., N. W. Washington, D. C.

VERLAG VON JULIUS SPRINGER IN BERLIN UND WIEN

Die Cytoarchitektonik der Hirnrinde des erwachsenen Menschen

Von

Constantin Freiherr von Economo

Dr. med., a. o. Professor der Psychiatrie und Neurologie in Wien, und

Dr. Georg N. Koskinas

em. Assistent der Psychiatrischen und Neurologischen Universitatsklinik in Athen

Bearbeitet an der Psychiatrischen Klinik Hofrat J. Wagner v. Jauregg-Wien

Textband

852 Seiten mit 162 zum Teil farbigen Abbildungen im Text

Atlas

Mit 112 mikrophotographischen Tafeln in besonderer Mappe

1925. Preis 600 R.M.

JUST FROM PRESS

Monograph No. 43

ESSAYS IN PSYCHOPATHOLOGY

By Dr. William A. White

Price $2.50

Nervous and Mental Disease Publishing Co.

3617 Tenth Street, N. W. Washington, D. C.

THE PERFECT POULTICE

Antiphlogistine

TRADE MARK

THE DENVER CHEMICAL MFG. CO.

The LIVERMORE SANITARIUM, LIVERMORE, CAL.

FOR NERVOUS AND MENTAL DISEASES

Situated in a beautiful valley, forty miles from San Francisco, two hours ride on the Southern Pacific Railroad. Elevation five hundred feet. Climate excellent with sunshine almost every day.

Large resident medical staff: Well trained nursing service: Clinical Laboratory; Hydrotherapy: Occupational Therapy: X-ray Departments; also Gymnasium, Bowling Alleys, Swimming Pool, Tennis and Croquet Courts. Dietary Department insures an excellent cuisine.

Separate Department for the functional neuroses. Cottage system for mental patients.

Several Bungalows for individual patients, wishing home-like surroundings with absolute privacy and the very best accommodations.

Rates, inclusive of routine examinations, general nursing and medical treatment, forty-five dollars per week and upward. Circulars on application.

J. W. ROBERTSON, M.D., Consulting.

V. H. PODSTATA, M.D., Supt.
C. W. MACK, M.D., Asst. Supt.
JEWEL FAY, M.D.

G. WILSE ROBINSON SANITARIUM COMPANY

G. WILSE ROBINSON, M.D.

Superintendent and Medical Director

Nervous and Mental Diseases

Sanitarium—8100 Independence Road
Office—937 Rialto Building
KANSAS CITY, MO.

THE CINCINNATI SANITARIUM

Established more than fifty years ago

A Private Hospital for Nervous and Mental Diseases

Secluded but easily accessible. Constant medical supervision. Registered charge nurses. Complete laboratory and hydrotherapy equipment. Dental department for examination and treatment. Occupational therapy. Ample classification facilities. Thirty acres in lawns and park.

F. W. LANGDON, M.D., and ROBERT INGRAM, M.D., Visiting Consultants
D. A. JOHNSTON, M.D., Resident Medical Director A. T. CHILDERS, M.D., Res. Physician

REST COTTAGE

This psychoneurotic unit is a complete and separate hospital building elaborate in furnishings and fixtures.

For terms apply to The Cincinnati Sanitarium, College Hill, Cincinnati, Ohio

DR. BARNES SANITARIUM

Stamford Connecticut

A Private Sanitarium for Mental and Nervous Diseases, also Cases of General Invalidism. Cases of Alcoholism and Drug Addiction Accepted.

A modern institution of detached buildings situated in a beautiful park of fifty acres, commanding superb views of Long Island Sound and surrounding hill country. Completely equipped for scientific treatment and special attention needed in each individual case.

Fifty minutes from New York City. Frequent train service. For terms and booklet address

F. H. BARNES, M.D., Med. Supt. Telephone 1867 Stamford, Conn.

FAIR OAKS

SUMMIT, N. J.

A sanatorium well equipped with the means for physical therapeutics (baths, electricity, etc.) and especially designed for the care and treatment of organic and functional nervous diseases, exhaustion states and cases requiring rest, hygienic, dietetic and occupational therapy. Summit is located in the beautiful hill country of New Jersey on the D. L. & W. Railroad, twenty miles from New York City.

Insane and tuberculous cases are not accepted

Telephone 143

DR. T. P. PROUT, Summit, N. J.

THE WALLACE SANITARIUM

SUCCEEDING WALLACE-SOMERVILLE SANITARIUM, MEMPHIS, TENN.

MEMPHIS, TENN.

WALTER R. WALLACE, M.D.
HUGH W. PRIDDY, M.D.
FOR THE TREATMENT OF

DRUG ADDICTIONS,

ALCOHOLISM, MENTAL AND

NERVOUS DISEASES

LOCATED IN THE EASTERN SUBURBS OF THE CITY. SIXTEEN ACRES OF BEAUTIFUL GROUNDS. ALL EQUIPMENT FOR CARE OF PATIENTS ADMITTED.

WESTBROOK SANATORIUM

RICHMOND, VIRGINIA

Rooms single, or en suite, with or without private baths. Hot water heat, electric lights and artesian water. Bowling, tennis, croquet, billiards and a gymnasium afford recreation. Electrical and hydrotherapy equipment. Nurses and attendants trained for this special work. Two of the physicians reside in the institution and devote their entire time to the patients.

The magnificent home of the late Major Ginter, by alterations and extensive additions, has been transformed into a private institution for the treatment of nervous diseases, mild mental cases and select alcoholic and drug habitues.

The grounds are ample, quiet is assured, and a new building for men makes easy the separation of the sexes. A number of cottages makes possible satisfactory and congenial grouping.

James K. Hall, M.D. Paul V. Anderson, M.D. E. M. Gayle, M.D

HARTFORD RETREAT

Established 100 Years

A sanitarium for the treatment of nervous and mental disorders by the most thoroughly approved methods—Dietotherapy, Hydrotherapy, Pharmacotherapy and Psychotherapy.

Dr. W. N. Thompson, Superintendent, Washington St., Hartford, Conn.

KENILWORTH, ILLINOIS
(Established 1905)
(C. & N. W. Railway, 6 miles north of Chicago)

Built and equipped for the treatment of nervous and mental diseases. Approved diagnostic and therapeutic methods. An adequate night nursing service maintained. Sound-proofed rooms with forced ventilation. Elegant appointments. Bath rooms en suite, steam heating, electric lighting, electric elevator.

Resident Medical Staff:

Sherman Brown, M.D. Mable Hoiland, M.D. Sanger Brown, M.D.

Consultation by appointment only

All correspondence should be addressed to KENILWORTH SANITARIUM, Kenilworth, Ill.

SEGUIN SCHOOL 1880 1926

for Children who Deviate Mentally from the Normal

Limited to 25 educable pupils—little girls and boys and young women (no epileptics—no insane); eleven experienced teachers; six governesses supervise play hours

Large grounds adjoining 50 acre park

Tuition and Board from Sept. 15 to June 15, $1800
Summer School in Mountains, June 15 to Sept. 15, $450

MRS. ELSIE M. SEGUIN, Director 500 South Centre St., Orange, N. J.

WESTWOOD LODGE

A modern, private sanatorium within fifteen miles of Boston, fully equipped for the scientific treatment of nervous and mild mental diseases, also for those in need of rest under medical supervision. The building stands in the midst of over one hundred acres comprising woodlands, cultivated gardens, beautiful pine groves and walks.

For further information, apply to
WILLIAM J. HAMMOND, M.D.
Resident Physician
Westwood Mass.

BOURNEWOOD

A Private Hospital for Mental Diseases

Number of patients limited to eighteen. Cases of alcohol or drug habituation not received. Telephone "Parkway 300." Nearest station, Bellevue on the N. Y., N. H. & H. R. R. Boston office, 48 Beacon Street. By appointment.

GEORGE H. TORNEY, M.D.

THE VAN VALEN SANATORIUM

Yonkers, N. Y.

Psycho-Therapeutic treatment for mental, nervous, functional disorders and addictions. Also receive patients needing care, with or without treatment.

Booklet Upon Request. Phone Yonkers 5321

THE NORBURY SANATORIUM

JACKSONVILLE ILLINOIS

Incorporated and Licensed.

For the treatment of Nervous and Mental Disorders.

Dr. Frank P. Norbury, Medical Director.
Dr. Albert H. Dollear, Superintendent.
Dr. Frank Garm Norbury, } Associate Physicians.
Dr. Samuel N. Clark, }

Address Communications
THE NORBURY SANATORIUM, Jacksonville, Illinois.

GLENMARY SANITARIUM

Owego, Tioga Co.
New York

For the care and treatment of a limited number of selected cases of Nervous and Mental Disease. Voluntary cases admitted. Epileptics treated and cared for. Absolute privacy and special ethical treatment for Alcohol and Drug Addictions. Close cooperation at all times with the family physician.

ARTHUR J. CAPRON. M.D., Physician-in-Charge.

Oconomowoc Health Resort

OCONOMOWOC, WIS.

Building New—Absolutely Fireproof

Built and Equipped for treating
NERVOUS AND MILD MENTAL DISEASES

Three Hours from Chicago on C. M. & S. P. Ry.

Location Unsurpassed
Readily Accessible

ARTHUR W. ROGERS, B.L., M.D.
Resident Physician in Charge

DIRECTORY FOR PRIVATE INSTITUTIONS

Anderson, Christian S., Hot Springs, Va. 19
Anderson, Dr. P. V., Richmond, Va. 12
Anderson, Dr. V. V., Shrewsbury, N. J. 19

Bailey, Dr. B. F., Lincoln, Nebraska 16
Barnes, Dr. F. H., Stamford, Conn. 12
Belle Mead Farm Colony and Sanatorium, Belle Mead, N. J. 6
Bournewood, Brookline, Mass. 14
Brooks, Dr. Swepson J., Rye, N. Y. 20
Brown, Dr. Sanger, Kenilworth, Ill. 13
Brown, Dr. Sherman, Kenilworth, Ill. 13

Caples, Dr. B. H., Waukesha, Wis. 16
Capron, Dr. A. J., Owego, Tioga Co., N. Y. 14
Carrol, Dr. R. S., Asheville, N. C. 18
Cavender, Dr. W. M., Shrewsbury, N. J. 19
Channing Sanitarium, Wellesley, Mass. 6
Cincinnati Sanitarium 11
Cook, Dr. R. H., Oxford, O. 15

Dold, Dr. William Elliott, River Crest, Astoria, L. I., New York City 16

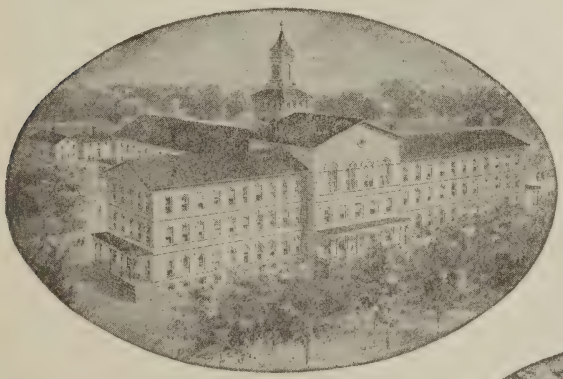
Easton Sanitarium, Easton, Pa. 19

Fair Oaks, Summit, N. J. 12

Gayle, Dr. E. M., Richmond, Va. 12
Glenmary Sanitarium, Owego, Tioga Co., N. Y. 14
Green Gables, Lincoln, Neb. 16

Hall, Dr. J. K., Richmond, Va. 12
Hammond, Dr. William J., Westwood, Mass. 13
Hartford Retreat, Hartford, Conn. 12
Highland Hospital, Asheville, N. C. 18

(*Continued on page XVII*)



OXFORD RETREAT A private hospital for Nervous and Mental Diseases, Alcoholic and Narcotic Inebriety. Incorporated 1883. Separate departments for men and women. Careful attention to proper classification, every convenience, and any accommodation desired. Facilities unsurpassed. Electricity, Hydrotherapy and Massage. Site elevated, retired and beautiful. Ninety-six acres in lawn and forest.

THE PINES A Neuropathic Hospital for women only. Mental cases not received in this building. First class in all its appointments. Under the same control and medical management as The Oxford Retreat. 39 miles from Cincinnati, 84 miles from Indianapolis, on C., H. & D. R. R.; ten trains daily. For references, terms and descriptive circular address,

R. HARVEY COOK, Physician-in-Chief,
Oxford, Butler Co., Ohio

MORPHINE DRUG ADDICTIONS AND ALCOHOLISM

Treated by the "*Quayle Method.*" A safe and easy way. Results guaranteed. Treatment is painless and supportive, rather than depressant. No nervous period experienced. I also furnish a *Home Treatment* for Physicians to use in treating addicts at home, who for various reasons are unable to go to a Sanitarium.

For full particulars address

DR. QUAYLE SANITARIUM

CHAS. H. QUAYLE, M.D., Medical Director

Dept. B MADISON, OHIO

RIVER CREST ASTORIA, L. I. N. Y. CITY

Home-like, well-equipped sanitarium for nervous and mild mental patients. Drug and alcoholic habitués are also received. Twenty-five years under same management. The physicians have unusually large experience. The site is exceptional. Nearest psychiatric institute to centre of Manhattan. Rates reasonable. Reached by all subways via Grand Central Station, Astoria car, Queensboro Tube. Located at Ditmars Avenue and Kindred Street. Phone 0820. City office 666 Madison Ave. Cor. 58th St. 3-4 daily. Phone Plaza 1470.

For Terms and Booklet address **WM. ELLIOTT DOLD, Physician in Charge**

DR. MOODY'S SANITARIUM

SAN ANTONIO, TEXAS

For Nervous and Mental Diseases, Drug and Alcohol Addictions, and Nervous Invalids Needing Rest and Recuperation.

Established 1903. Strictly ethical. Location delightful, summer and winter. Approved diagnostic and therapeutic methods. Modern clinical laboratory. 7 buildings, each with separate lawns, each featuring a small separate sanitarium, affording wholesome restfulness and recreation, indoors and outdoors, tactful nursing and homelike comforts. Bathrooms ensuite, 100 rooms, large galleries, modern equipment. 15 acres, 350 shade trees, cement walks, playgrounds. Surrounded by beautiful parks, Government Post grounds and Country Club.

G. H. MOODY, M.D., Supt.
T. L. MOODY, M.D., Res. Phys.

J. A. McINTOSH, M.D., Res. Phys.

WAUKESHA SPRINGS SANITARIUM
WAUKESHA, WISCONSIN

For the Care and Treatment of
NERVOUS AND MENTAL DISEASE

Building absolutely fireproof

BYRON M. CAPLES, M.D., Medical Director
FLOYD W. APLIN, M.D. and
L. H. PRINCE, M.D.

GREEN GABLES

The Dr. Benj. F. Bailey Sanatorium

Lincoln, Nebraska

A scientifically equipped, homelike institution, housed in brick and stone buildings, located in its own park of twenty-five acres

Idylease Inn, Newfoundland, N. J. 20
Interpines, Goshen, N. Y. 18

Kellogg, Dr. T. H., Riverdale, N. Y. 20
Kenilworth Sanitarium, Kenilworth, Ill. 13
Kidd, Dr. R. A., Columbus, O. 18

Livermore Sanitarium, Livermore, California 11

McFarland, Dr. D. W., Green's Farms, Conn. 20
McFarland, Dr. D. W., Hastings-on-Hudson, N. Y. 6
McIntosh, Dr. J. A., San Antonio, Tex. 16
MacMillen Sanitarium, Columbus, O. 18
Milwaukee Sanitarium, Wauwatosa, Wis. 6
Moody, G. H., Dr. Moody's Sanitarium, San Antonio, Tex. 16
Moody, T. L., San Antonio, Tex. 16

Norbury Sanitarium, Dr. F. P. Norbury, Jacksonville, Ill. 14

Oconomowoc Health Resort, Oconomowoc, Wis. 14
Orchards, Stamford, Conn. 20
Oxford Retreat, Oxford, Ohio 15

Podstata, Dr. V. H., Livermore, California 11
Potter, Dr. C. A. 18
Priddy, Dr. Hugh W. 12
Prout, Dr. T. P., Summit, N. J. 12

Quayle, Dr. Chas. H., Dr. Quayle Sanitarium 16

River Crest, Astoria, L. I., New York City 16
Robinson, Dr. G. W., Kansas City, Mo. 11
Rogers, Dr. A. W., Oconomowoc, Wis. 14
Ruland, Dr. F. D., Westport, Conn. 18

Seguin School, Orange, N. J. 13
Seward, F. W., Goshen, N. Y. 18
Sleyster, Dr. Rock, Wauwatosa, Wis. 6
Spring Hill Sanitarium, Hastings-on-Hudson, N. Y. 6
Spruces, Shrewsbury, N. J. 19

The Pines, Oxford, O. 15
Thompson, W. N., Hartford, Conn. 12

(*Continued on page XXI*)

JUST OUT

NERVOUS AND MENTAL DISEASE MONOGRAPH NO. 32

Foundations of Psychiatry

By WILLIAM A. WHITE, M.D., of Washington, D. C.

An Examination of the Fundamental Concepts which are Necessary to an Understanding of Mental Disease.

CONTENTS: Chap. I: Introduction; Chap. II: The Unity of the Organism: The Biological Point of View—Integration—Structuralization—Individuation; Chap. III: The Dynamics of the Organism: The Canon of Physiology (The Conflict)—Ambivalency; Chap. IV: The Stratification of the Organism: The Physiological Level—The Psychological Level—The Sociological Level; Chap. V: The Region of Psychopathology; Chap. VI: The Nature of the Neuroses and the Psychoses; Chap. VII: Therapeutics: Action, Objectification—Transference—Resymbolization; Chap. VIII: The Social Problem: Elevation—Rationalization—Sublimation—The Socialization of Strivings; Chap. IX: Conclusion.

Nervous and Mental Disease Pub. Co.,
3617 Tenth Street, N. W.
WASHINGTON, D. C.

Just Published

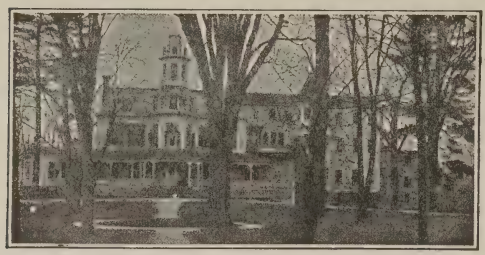
An Introduction to OBJECTIVE PSYCHOPATHOLOGY

By *G. V. Hamilton, M.D.,* Director of Psychobiological Research, Bureau of Social Hygiene, Inc., N. Y.; With Foreword by *Robert M. Yerkes, Ph.D., LL.D.,* Professor of Psychology, Yale University. 354 pages, 6 x 9, special jacket. Cloth, $5.00.

Every teacher, every physician, every one who deals with problems of personnel should read this book. Every psychologist worthy of the name, and doubtless many who are not, will read it. You will want this epoch-making contribution. Professor Yerkes says: "I hail this book with delight as the first chapter of a new and promising psychopathology."

Send for your copy today

C. V. Mosby Company, Publishers,
St. Louis, Mo.



"INTERPINES"

BEAUTIFUL QUIET
RESTFUL HOMELIKE

Thirty-four years of successful work, thoroughly reliable, dependable and ethical. Every comfort and convenience; accommodations of superior quality.

DR. F. W. SEWARD, JR.

Phone 117

DR. C. A. POTTER,
DR. ROSE C. WILDER,
Goshen, N. Y.

HIGHLAND HOSPITAL

Succeeding Dr. Carroll's Sanitarium

An institution employing all rational methods for the treatment of Nervous, Habit and Mild Mental cases; especially emphasizing the natural curative agents—Rest, Climate, Water, Diet and Work.

In ASHEVILLE, winter's rigor and summer's heat are alike tempered. An elevation of 2500 feet, remarkable scenery and a superb climate have made Asheville famous. For booklet address

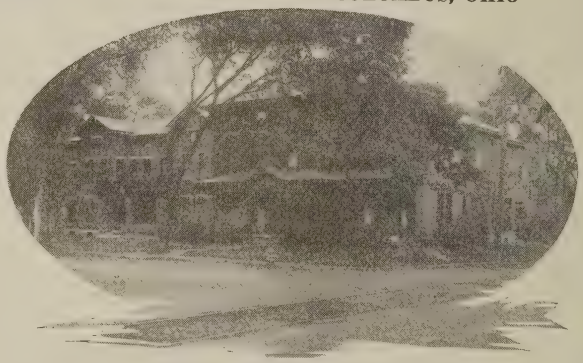
ROBT. S. CARROLL, Medical Director **ASHEVILLE, N. C.**

McMILLEN SANITARIUM

COLUMBUS, OHIO

For treatment of Nervous and Mental Diseases, Alcohol and Drug Addictions.

Modern in all classes of treatments administered. Specialists services, laboratory facilities, ideal location. Prices reasonable. For booklet and particulars address DR. ROBERT A. KIDD, Supt.



McMILLEN SANITARIUM
Corner Nelson Rd. & East Fifth Ave., Columbus, Ohio

THE WESTPORT SANITARIUM

WESTPORT, CONNECTICUT

For the care and treatment of nervous and mental diseases, with special attention to chronic nervous cases. Modern appointments, home life, beautiful surroundings, large private grounds. Private attendants and cottage care if desired. Committed or voluntary patients received.

For information and terms, address

Tel. 4, Westport, Conn. DR. F. D. RULAND, Medical Superintendent.

FIRST AND THIRD WEDNESDAYS, 10:30 A. M. to 12:30 P. M.
40 East 41st St., 6950 Murray Hill, New York City WESTPORT, CONN.

VIRGINIA HOT SPRINGS

America's Greatest Health Resort

Take the Cure at VIRGINIA HOT SPRINGS for Rheumatism, Gout and Nervous Diseases.

Bathe in naturally heated water (104°)

Complete hydrotherapeutic apparatus and Nauheim treatment installed at

VIRGINIA HOT SPRINGS

Free from Humidity — Free from Mosquitoes
2,500 Feet Elevation — Open ALL the Year

WATERS, BATHS, HOTEL AND SCENERY
NOWHERE EQUALLED

Average Temperature, Aug. 77°F.; Sept. 75°F.; Oct. 64°F.

PLAYGROUND OF AMERICA—Golf, Tennis, Swimming Pool, Riding. Driving and Walks Unsurpassed. The New Homestead Hotel, Best in America. Broker's Office, Logan & Bryan, with direct New York wire.

New York Booking Office: Ritz Carleton Hotel, 46th Street and Madison Avenue
For Booklets, etc., apply to

CHRISTIAN S. ANDERSON, Resident Manager. Hot Springs, Va., U. S. A.

LICENSED 31 YEARS

THE EASTON SANITARIUM

EASTON, PENNSYLVANIA

A PRIVATE INSTITUTION for the care and treatment of nervous and mental disorders, conditions of semi-invalidism, aged people and selected cases of drug addiction and alcoholism. Homelike atmosphere; personal care; outdoor recreation and occupation year round; delightfully located overlooking the Delaware River and the city of Easton; 2 hours from New York City; 68 miles from Philadelphia. For booklet and particulars address **S. S. P. WETMORE, M.D., Medical Director,** or phone 166 Easton.

"THE SPRUCES"

SHREWSBURY NEW JERSEY

A MENTAL HYGIENE SCHOOL—for the treatment and training of problem children. Particular attention is given to those suffering from behavior disorders, personality difficulties, psychoneuroses and the like.

V. V. ANDERSON, M.D., Medical Director — **Telephone—Red Bank 1634** — **W. M. CAVENDER, Executive Assistant**

NEW TENTH EDITION
(Revised and Enlarged)

Outlines of Psychiatry

By WILLIAM A. WHITE

A clearly written and concise presentation of psychiatry, especially adapted for use in teaching and in public institutions for mental disease.

PRICE $4.00

Nervous and Mental Disease Publishing Co.
3617 Tenth Street, N. W. Washington, D. C.

THE ORCHARDS, STAMFORD, CONN.

A PSYCHOANALYTIC INSTITUTE

For the treatment and psychoanalytic study of neurotic and convulsive disorders, in addition to every phase of physical and mental reconstruction and habit training. Diversified farm occupations. Small private home. Terms in accordance with amount of care and attention given. Trained resident staff under direct supervision of New York neuropsychiatrist.

T. E. UNIKER, Assistant in Charge, Box 345, Stamford, Conn.
Telephone Stamford 1630

IDYLEASE INN

40 miles from New York — Newfoundland, N. J. — 1000 feet above sea-level

A modern health resort treating mild functional disorders of the nervous system, convalescents, and those needing a change of environment. Mental, tuberculous and otherwise objectionable cases are not received. The atmosphere of a large country home rather than that of a hospital is studiously maintained.

Booklet on request

DR. McFARLAND'S SANITARIUM

"HALL-BROOKE"

FOR MENTAL, NERVOUS, AND HABIT CASES

Beautifully situated on Long Island Sound. The grounds, consisting of over 100 acres laid out in walks and drives, are inviting and retired.

Patients received from any location. Address

Telephone 140
WESTPORT, CONNECTICUT

D. W. McFARLAND, M.D.
GREEN'S FARMS, CONNECTICUT

Dr. Kellogg's House

Under State License *for the Care and Treatment of Nervous and Mental Diseases. Select Cases and Limited Number*

Modern appointments and handsome surroundings. Committed or voluntary patients received. Trains hourly to Riverdale Station, Hudson River Railroad, or Van Cortlandt Station, Putnam Railroad, or by Broadway Subway to 242d street, and then Broadway Trolley to 253d street, one block from the house. Address letters or telegrams to Dr. Theodore H. Kellogg.

CORNER RIVERDALE LANE AND ALBANY POST ROAD

N. Y. City Telephone, 36 Kingsbridge

RIVERDALE, NEW YORK CITY

DR. BROOKS HOUSE

RYE, N. Y.

Post Office and R. R. Station, Harrison, N. Y.

TELEPHONE PARK 893

A Private Hospital, on the cottage plan, for the treatment of Nervous and Mild Mental Diseases. Number limited to eleven. Situated on the Boston Post Road just east of Park Avenue, 22 miles from Columbus Circle, New York.

DR. SWEPSON J. BROOKS, Physician-in-Charge.

Torney, Dr. G. H., Brookline, Mass. 14
Towns, Charles B., Hospital, New York City 8

Uniker, T. E., Stamford, Conn. 20

Van Valen Sanatorium, Yonkers, N. Y. 14
Virginia Hot Springs, Hot Springs, Va. 19

Wallace Sanitarium, Memphis, Tenn. 12
Wallace, Walter R., M.D. 12
Washburne, Dr. G. F., Hastings-on-Hudson, N. Y. 6
Waukesha Springs Sanitarium, Waukesha, Wis. 16
Westbrook Sanitarium, Richmond, Va. 12
Westport Sanitarium, Westport, Conn. 18
Westwood Lodge, Westwood, Mass. 13
Wetmore, S. S. P., Easton, Pa. 19
Wilder, Dr. Rose C. 18

Band 43:

MYELOGENETISCH-ANATOMISCHE UNTERSUCHUNGEN ÜBER DEN ZENTRALEN ABSCHNITT DER SEHLEITUNG

Von

Dr. phil. et med. **Richard Arwed Pfeifer**

Oberassistent der Klinik und a. o. Professor für Psychiatrie und Neurologie an der Universität Leipzig

153 Seiten mit 119 zum Teil farbigen Abbildungen 1925 18 Rm.

Verlag von Julius Springer in Berlin W-9

(Ready January 1926)

Monograph No. 44

HYSTERIA

By ERNEST KRETSCHMER, M.D.
A. O. Professor of Neurology and Psychiatry
IN TÜBINGEN

Authorized English Translation
By OSWALD H. BOLTZ, M.D.

CONTENTS

PART I. HYSTERIA, INSTINCT AND IMPULSE
Chapter I. The Violent-Motor-Reaction and the Sham-Death-Reflex.
Chapter II. Hysteria and the Impulsive Life.
PART II. THE PSYCHOPHYSICAL DYNAMICS OF HYSTERIA
Chapter III. The Hysterical Habit-Formation.
Chapter IV. The Laws of Voluntary Reinforcement of a Reflex.
Chapter V. The Volitional Apparatuses of the Hysterical.
Chapter VI. The Transformations of Experience.

Price $2.50

Nos. 2, 3, 6, 8, 9, 10, 11, 15, 17, 19, 21, 22, 23, 24, 25, 27, 30 out of Print

Nervous and Mental Disease Monograph Series

Edited by

SMITH ELY JELLIFFE, M.D., WILLIAM A. WHITE, M.D.

No. 1. Outlines of Psychiatry. (Tenth Edition, 1924.) By WM. A. WHITE, M.D., Price $4.00. A clearly written and concise presentation of psychiatry especially adapted for use in teaching and in public institutions for mental diseases.

No. 4. Selected Papers on Hysteria and other Psychoneuroses. (Third Edition, enlarged, 1920.) By S. FREUD. Price $3.00.

No. 5. Wassermann Serum Reaction in Psychiatry. By FELIX PLAUT, M.D., Price $2.00. A most complete setting forth of the principles of the Wassermann Reaction by one of the original investigators in this field, especially adapted for laboratories and for use in institutions.

No. 7. Three Contributions to Theory of Sex. (Third Edition, 1918.) By PROF. SIGMUND FREUD, Price $2.00. A most important contribution to the psychology of psycho-sexual development.

No. 12. Cerebellar Functions. By DR. ANDRE-THOMAS, Price $3.00. (Illustrated.) Tr. by Dr. C. Herring. A complete exposition of the anatomy and physiology of the cerebellum and their application to the problems of clinical medicine.

No. 13. History of the Prison Psychoses. By DRS. P. NITSCHE and K. WILMANNS, Price $1.25. The only complete exposition in English of the history of the prison psychoses and the present-day concept of this group of mental disturbances.

No. 14. General Paresis. By PROF. E. KRAEPELIN, Price $3.00. (Illustrated.) A masterly presentation of the subject of general paresis by the renowned Munich professor.

No. 16. Poliomyelitis. By DR. I. WICKMANN, Price $3.00. (Illustrated.) Tr. by Dr. W. J. M. A. Maloney. A complete exposition of the poliomyelitis situation.

No. 26. Technique of Psychoanalysis. By DR. SMITH ELY JELLIFFE. Second Edition, 1921. Price $2.50. A manual for beginners in psychoanalysis.

No. 28. Autonomic Functions and the Personality. By EDW. J. KEMPF, M.D. Second Edition. Price $3.00.

No. 31. Sleep-Walking and Moon-Walking. By J. SADGER, Price $2.00.

No. 32. Foundations of Psychiatry. By WM. A. WHITE. Price $3.00.

No. 33. Psychoanalysis and Endocrinopathies. By DUDLEY W. FAY, Ph.D. Price $2.50.

No. 34. Psychoanalysis and the Drama. By SMITH ELY JELLIFFE and LOUISE BRINK. Price $3.00.

No. 35. The Constitutional Factors in Dementia Precox with Particular Attention to the Circulatory System and to Some of the Endocrine Glands. By NOLAN D. C. LEWIS, M.D. Price $3.00.

No. 36. The Primitive Archaic Forms of Inner Experiences and Thought in Schizophrenia. A Genetic and Clinical Study of Schizophrenia. By DR. ALFRED STORCH. Price $2.00.

No. 37. Women Characters in Richard Wagner. By LOUISE BRINK, Ph.D. $2.00.

No. 38. An Introduction to the Study of the Mind. By DR. W. A. WHITE. $2.00.

No. 39. The Emotions, Morality, and the Brain. By C. v. MONAKOW. Price $2.00.

No. 40. The Development of Psychoanalysis. By S. FERENCZI and O. RANK. Price $2.00.

No. 41. Studies in Psychiatry. Vol. II. New York Psychiatric Society. Price $3.00

No. 42. Psychoanalysis and General Paresis. By O. HOLLOS and P. FERENCZI. Price $1.50.

No. 43. Essays in Psychopathology. By WM. A. WHITE. Price $2.50.

No. 44. Hysteria. By E. Kretschmer. Price $2.50.

Orders should be ACCOMPANIED BY CHECK and sent to

Nervous and Mental Disease Publishing Co.

3617 Tenth Street, N. W. Washington, D. C.

ERGOAPIOL (Smith)

For
AMENORRHEA
DYSMENORRHEA
MENORRHAGIA
METRORRHAGIA
ETC.

ERGOAPIOL (Smith) is supplied only in packages containing twenty capsules.

DOSE: One to two capsules three or four times a day.

SAMPLES and LITERATURE SENT ON REQUEST.

MARTIN H. SMITH COMPANY, New York, N.Y., U.S.A.

SAL HEPATICA

Laxative and Eliminant

Efficacious in all conditions where intestinal sluggishness arising from functional derangements of the liver and portal circulation is a factor.

Sal Hepatica cleans the entire alimentary canal.

Samples for Clinical Purposes

BRISTOL-MYERS CO.
New York

The PHYSICIAN PRESCRIBES

but the final Judge of the results and benefits is, on many occasions, the patient or consumer of

PLUTO WATER
Concentrated

not a new, unknown "INTESTINAL ELIMINANT" but a True and Tried one which has been used by the Medical Profession for nearly half a century.

Liberal samples sent free to Physicians for the asking

French Lick Springs Hotel Company

French Lick, Indiana

Exchange or Want Column

This column is for those who desire to give, sell, buy or exchange journals, books or preparations connected with neuropsychiatry. *Send all communications to Journal office.*

Wanted: Bound or unbound copies of Vols. 1, 2, 3, 4; Vol. 47, Nos. 1 and 3; Vol. 57, No. 1. For following will pay $1.50 per copy, 1876, complete; 1885, Nos. 1, 2, 4; 1886, Nos. 3, 11, 12; 1887, Nos. 9, 10; 1889, Nos. 1, 2, 3, 4, 5, 6; 1890, No. 5; 1892, Nos. 11, 12. Journal of Nervous and Mental Disease.

Wanted: Bound or unbound copies of January, 1917; January, 1918; October, 1918; April, 1919; January, 1919; October, 1919; January, 1920; January, 1921; April, 1921, Psychoanalytic Review.

Wanted: Bound or unbound copies of Alienist and Neurologist, Journal of Abnormal Psychology, Vol. XI.

Wanted: Bound or unbound copies of "Imago" and "Zeitschrift für Psychoanalyse." Imago, Vol. VI, No. 1.

Wanted: Bourneville et Geurard: Le Sclerose en plaques, 1869.

Wanted: Photographs of Valentiner; Ordenstein; J. Parkinson.

JOURNAL OF NERVOUS AND MENTAL DISEASE

64 West 56th St., New York

The Psychoanalytic Review

A Journal Devoted to an Understanding of Human Conduct

Edited and Published by

WILLIAM A. WHITE, M.D., and SMITH ELY JELLIFFE, M.D.

CONTENTS, APRIL, 1926

ORIGINAL ARTICLES

The Genesis of Genitality. O. Rank.

Psychoanalysis and Heaven. L. E. Hinsie.

Psychoanalytic Improvisations and the Personal Equation. T. Burrow.

Psychoanalytic Study of a Case of Organic Epilepsy. K. A. Menninger.

Paranoia from the Subjective Point of View. A "Paranoiac."

SPECIAL REVIEW

"Form" Psychology and Psychoanalysis. I. H. Coriat.

SOCIETY PROCEEDINGS

Ninth International Psychoanalytic Congress. S. E. Jelliffe.

ABSTRACTS.

Issued Quarterly: $6.00 per Volume; Single Numbers, $1.75; Foreign, $6.60

Copyright 1926 by the

NERVOUS AND MENTAL DISEASE PUBLISHING COMPANY

3617 10th St., N. W., Washington, D. C.

Compound Syrup of Hypophosphites "FELLOWS"

1866—1926

Not a new-born prodigy or an untried experiment, but a remedy whose usefulness has been fully demonstrated for more than half a century of clinical application.

The Standard Tonic for 60 Years

℞ Syr. Hypophos. Comp. "FELLOWS"

Reject < Cheap and Inefficient Substitutes
Preparations "Just as Good"

Fellows Medical Manufacturing Co., Inc.
26 Christopher Street, New York, N. Y.

NEW MONOGRAPHS

No. 37. WOMEN CHARACTERS IN RICHARD WAGNER. By Louise Brink, Ph.D. Price $2.00.

No. 38. AN INTRODUCTION TO THE STUDY OF THE MIND. By Wm. A. White. Price $2.00.

No. 39. THE EMOTIONS, MORALITY, AND THE BRAIN. By C. v. MONAKOW. Price $2.00.

No. 40. THE DEVELOPMENT OF PSYCHOANALYSIS. By S. Ferenczi and O. Rank. Price $2.00.

No. 41. STUDIES IN PSYCHIATRY. Vol. II. New York Psychiatric Society. Price $3.00.

No. 42. PSYCHOANALYSIS AND GENERAL PARESIS. By O. Hollos and P. Ferenczi. Price $1.50.

No. 43. ESSAYS IN PSYCHOPATHOLOGY. By Wm. A. White. $2.50.

No. 44. HYSTERIA. By E. Kretschmer. Price $2.50.

Nervous and Mental Disease Monograph Series

3617 10th St., N. W. Washington, D. C.

A Therapeutic Sheet - Anchor

Strychnine is a therapeutic sheet-anchor in the treatment of disordered conditions of the nervous system.

ESKAY'S NEURO PHOSPHATES

contains strychnine glycerophosphate in peculiarly soluble and diffusible form. Not only does it stimulate nerve cell function and improve nerve cell nutrition, but it also acts as a stomachic-bitter, increasing the appetite and the flow of gastric juice.

SMITH, KLINE & FRENCH CO.
105-115 North 5th Street
Philadelphia, Pa.
Established 1841
Manufacturers of *Eskay's Food*

UNIVERSITY OF ILLINOIS-URBANA
3 0112 076144705